

Work Order ID 130191

130191

Page 1

February-26-15 3:20:28 PM

Item ID: D412-664-403 USED

Accept

N9000040100

Setup Start *NS1*

Revision ID:

Stop *NS2*

Item Name: 412 Stainless Steel Aft Crosstubes - High

Start Date: 2/26/15 Start Qty: 1.00 *1*

Cust Item ID:

Required Date: 3/06/15 Req'd Qty: 1.00 *1*

Customer:

Reference:

Approvals:

Process Plan: *u*

Date:

Tooling:

Date:

Run Start *NR1*

QC:

Date:

SPC (Y/N):

Date:

Stop *NR2*

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

Draw Nbr

Revision Nbr

D412-664-443

A U/R

130

130

Crosstubes

Crosstubes

Crosstubes

Memo

PULL FROM RA111748

1 X D412-664-403 B109981

(REF: W/O 118426 FOR START OF W/O... WAS IDENTIFIED AS D412-664-203, BUT WAS -403)

STRIP TUBE ENTIRELY →

Grind tube to standard finish — BL

15/03/02

135

135

Powdercoat

Powder Coating

White Gloss(Ref:4.3.5.2) per QSI005 4.3-Steel

0.00

Memo

0.00

POWDER COAT ONE SIDE OF CROSSTUBE ONLY, WHITE, PER QSI005

M 129806

400°

start 8:00

fin 8:40

CA
15-03-04

SCRAP

Work Order ID 130191

130191

Page 2

February-26-15 3:20:28 PM

Item ID: D412-664-403 USED Accept *N900040100* Setup Start *NS1*
 Revision ID: Stop *NS2*
 Item Name: 412 Stainless Steel Aft Crosstubes - High
 Start Date: 2/26/15 Start Qty: 1.00 *1* Cust Item ID:
 Required Date: 3/06/15 Req'd Qty: 1.00 *1* Customer:
 Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start *NR1*
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
180	SprayPaint	0.00				1			CN1503.05
180									
SprayPaint	Memo	0.00							
Spray Painting	Prime OTHER SIDE OF CROSSTUBE ONLY QSI 005 4.2 BATCH: 136128								
	Paint SAME SIDE AS PRIMED PER QSI 005 4.2 BATCH: 131669								
	INDICATE WITH MASKING TAPE, WHICH SIDE IS SPRAY AND WHICH SIDE IS POWDER COAT								
190	QC14- Inspect Spray Paint	0.00							
190									
QC	Memo	0.00							
Quality Control	SEE NIGEL TO DO PAINT ADHESION TEST ON BOTH SIDES								

paint testing tube
 scrap per Nigel.

Work Order ID 130191***130191***

Page 3

February-26-15 3:20:28 PM

Item ID: D412-664-403 USED

Accept

N900040100Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: 412 Stainless Steel Aft Crosstubes - High

Start Date: 2/26/15 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 3/06/15 Req'd Qty: 1.00 ***1***

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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205

0.00

205

Purchasing

Memo

0.00

Purchasing

ISSUE PO TO EXOVA FOR GRAVEL TESTING (SEE NIGEL)
PO _____

215

Receive & Inspect for Damage & Mat'l Certs

0.00

215

Packaging

Memo

0.00

Packaging

250

QC21- Final Inspection - Work Order Release

0.00

250

QC

Memo

0.00

Quality Control

Picklist Print

February-26-15 3:20:57 PM

Page 1

Work Order ID: 130191

130191

Parent Item: D412-664-403 USED

D412-664-403 USED

Parent Item Name: 412 Stainless Steel Aft Crosstubes - High

Start Date: 2/26/15

Required Date: 3/06/15

Start Qty: 1.00

Required Qty: 1.00

Comments:

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
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D412-664-203

Manufactured No

Each 5.0000

1

D412-664-203

Aft Crosstube - High

Location

Loc Qty

Loc Code

BSKT001

3

124776

1

124777

1

124778

1

FG

2

121881

1

121882

1

REQUIRES INSP

Wildcat Helicopters Inc.

603-H SINCE NEW

AM/O APPROVAL No 85-99

W/O No

NOMENCLATURE AFT EXT HIGH CROSS TUBE

PART No D412-596-203

MAKE DART

MODEL or TYPE EXT HIGH

SERIAL No B100654

A/C REG WTR

TIME REMOVED 20039.7

HOLD FOR INSP

S/R M REF

REASON FOR REMOVAL INSTALL STANDARD

HIGH GEAR

DATE SEPT 25 2014

SIGN

[Signature]

REPAIRABLE

Work Order ID 122839

Tuesday, July 29, 2014 3:34:49 PM

122839

Page 1

Item ID: D412-664-403

Accept

N900040100

Setup Start

NS1

Revision ID:

Stop

NS2

Item Name: 412 Stainless Steel Aft Crosstubes - High

Start Date: 7/29/2014 Start Qty: 1.00

1

Cust Item ID:

Required Date: 8/8/2014 Req'd Qty: 1.00

1

Customer:

Reference: RMA RA111748

Approvals:

Process Plan: MF

Date: 14-7-29

Tooling:

QC:

Date:

SPC (Y/N):

Run Start

NR1

Stop

NR2

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Accept
ty

Reject
Qty

Reject
Number

Insp.
Stamp

Draw Nbr

Revision Nbr

D412-664-443

A

260

0.00

260

QC

Quality Control

Memo

0.00

INSPECT RA 111748
D412-664-403 X 1 B109981

NEEDS TO BE REWORKED PER RS1018
(REF W/O118426 FOR START OF WORKORDER... WAS IDENTIFIED AS
D412-664-203 BUT IS NOT)

261

0.00

261

HandFinish

Hand Finishing

Memo

0.00

REMOVE ALL HARDWARE & D4910-1 AND SCRAP

REMOVE D4909-1 X 1 B109972 AND SET ASIDE, CLEAN ALL
ADHESIVE FROM IT

STRIP ALL PAINT AND PRIMER PER

RA was
inspected in
July

Cancelled
Now 130191

POSSIBLE

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS <table style="width: 100%;"> <tr> <td>Skid-tube ☐</td> <td>Crosstube ☐</td> <td>Water Jet ☐</td> <td>Engineering ☐</td> </tr> <tr> <td>Machining ☐</td> <td>Small Fab ☐</td> <td>Prod. Eng. Coord. ☐</td> <td>Quality ☐</td> </tr> <tr> <td>Thermoforming ☐</td> <td>Finishing ☐</td> <td>Rec/Store/Packaging ☐</td> <td>Other ☐</td> </tr> <tr> <td>Large Fab ☐</td> <td>Composite ☐</td> <td>Supplier ☐</td> <td></td> </tr> </table>	Skid-tube ☐	Crosstube ☐	Water Jet ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	Large Fab ☐	Composite ☐	Supplier ☐	
Skid-tube ☐	Crosstube ☐	Water Jet ☐	Engineering ☐															
Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐															
Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐															
Large Fab ☐	Composite ☐	Supplier ☐																

Root Cause	Date	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design									
Doc/Data									
Equip/Tooling									
Handling/Pre									
Material									
Operator									
Offset/Setup									
Process									
Supplier									
Training									
Transport									
Unapproved									

FAULT CATEGORY

Landing Gear ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Inspection Strip in Tube ☐ Marks/Chatter ☐ Turning Sequence ☐ Wave/Twist in Tube	General ☐ Bend ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Burrs ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Drawing ☐ Drill Holes ☐ Finish ☐ Fit/Function	☐ Folio/Program ☐ Grain ☐ Hardware ☐ Inspection Incomplete/Unqualified ☐ Instructions Incomplete/Unclear ☐ Misaligned/off center ☐ Mislabeled ☐ Misread ☐ Off-set ☐ Out of Calibration ☐ Out of Sequence	☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Positioned Wrong ☐ Power Loss/Surge ☐ Pressure/Forced ☐ Set-up ☐ Temperature/Cure ☐ Weld ☐ Wrong Stock Pulled ☐ Other
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DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Crosstube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐
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Root Cause	Date	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design									
Doc/Data									
Equip/Tooling									
Handling/Pre									
Material									
Operator									
Offset/Setup									
Process									
Supplier									
Training									
Transport									
Unapproved									

FAULT CATEGORY

Landing Gear ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Inspection Strip in Tube ☐ Marks/Chatter ☐ Turning Sequence ☐ Wave/Twist in Tube	General ☐ Bend ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Burrs ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Drawing ☐ Drill Holes ☐ Finish ☐ Fit/Function	☐ Folio/Program ☐ Grain ☐ Hardware ☐ Inspection Incomplete/Unqualified ☐ Instructions Incomplete/Unclear ☐ Misaligned/off center ☐ Mislabeled ☐ Misread ☐ Off-set ☐ Out of Calibration ☐ Out of Sequence	☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Positioned Wrong ☐ Power Loss/Surge ☐ Pressure/Forced ☐ Set-up ☐ Temperature/Cure ☐ Weld ☐ Wrong Stock Pulled ☐ Other
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Work Order ID 122839

Tuesday, July 29, 2014 3:34:49 PM

122839

Page 3

Item ID: D412-664-403 Accept *N900040100* Setup Start *NS1*
 Revision ID: Stop *NS2*
 Item Name: 412 Stainless Steel Aft Crosstubes - High
 Start Date: 7/29/2014 Start Qty: 1.00 *1* Cust Item ID:
 Required Date: 8/8/2014 Req'd Qty: 1.00 *1* Customer:
 Reference: RMA RA111748

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start *NR1*
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
290	Outsource process - Heat Treat	0.00							
290									
Outsource1	Memo	0.00							
Outsource process - Heat Treat	ISSUE P/O TO METCOR: _____								
	Stress relief								
300	Receive & Inspect for Damage & Mat'l Certs	0.00							
300									
Packaging	Memo	0.00							
Packaging									
310	QC15- Crosstube Dimensional Check	0.00							
310									
QC	Memo	0.00							
Quality Control	MEASURE AL DIMENSIONS OF CROSS TUBE AND FILL OUT FAI								

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS <table style="width: 100%;"> <tr> <td>Skid-tube ☐</td> <td>Crosstube ☐</td> <td>Water Jet ☐</td> <td>Engineering ☐</td> </tr> <tr> <td>Machining ☐</td> <td>Small Fab ☐</td> <td>Prod. Eng. Coord. ☐</td> <td>Quality ☐</td> </tr> <tr> <td>Thermoforming ☐</td> <td>Finishing ☐</td> <td>Rec/Store/Packaging ☐</td> <td>Other ☐</td> </tr> <tr> <td>Large Fab ☐</td> <td>Composite ☐</td> <td>Supplier ☐</td> <td></td> </tr> </table>	Skid-tube ☐	Crosstube ☐	Water Jet ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	Large Fab ☐	Composite ☐	Supplier ☐	
Skid-tube ☐	Crosstube ☐	Water Jet ☐	Engineering ☐															
Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐															
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Large Fab ☐	Composite ☐	Supplier ☐																

Root Cause	Date	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design									
Doc/Data									
Equip/Tooling									
Handling/Pre									
Material									
Operator									
Offset/Setup									
Process									
Supplier									
Training									
Transport									
Unapproved									

FAULT CATEGORY

Landing Gear ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Inspection Strip in Tube ☐ Marks/Chatter ☐ Turning Sequence ☐ Wave/Twist in Tube	General ☐ Bend ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Burrs ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Drawing ☐ Drill Holes ☐ Finish ☐ Fit/Function	☐ Folio/Program ☐ Grain ☐ Hardware ☐ Inspection Incomplete/Unqualified ☐ Instructions Incomplete/Unclear ☐ Misaligned/off center ☐ Mislabeled ☐ Misread ☐ Off-set ☐ Out of Calibration ☐ Out of Sequence	☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Positioned Wrong ☐ Power Loss/Surge ☐ Pressure/Forced ☐ Set-up ☐ Temperature/Cure ☐ Weld ☐ Wrong Stock Pulled ☐ Other
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Work Order ID 122839

122839

Page 4

Tuesday, July 29, 2014 3:34:49 PM

Item ID: D412-664-403

Accept

N900040100

Setup Start *NS1*

Revision ID:

Stop *NS2*

Item Name: 412 Stainless Steel Aft Crosstubes - High

Start Date: 7/29/2014 Start Qty: 1.00 *1*

Cust Item ID:

Required Date: 8/8/2014 Req'd Qty: 1.00 *1*

Customer:

Reference: RMA RA111748

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start *NR1*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
320		0.00							
320									
Outsource2	Memo	0.00							
Outsource process - NDT	ISSUE P/O TO ACCUREN: _____								
	PERFORM LPI INSPECTION ON 100% OF TUBE								
330	QC6- Inspect dimensions to drawing	0.00							
330									
QC	Memo	0.00							
Quality Control									

W

DQA: _____ Date: _____



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Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Crosstube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐
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Root Cause	Date	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design									
Doc/Data									
Equip/Tooling									
Handling/Pre									
Material									
Operator									
Offset/Setup									
Process									
Supplier									
Training									
Transport									
Unapproved									

FAULT CATEGORY

Landing Gear ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Inspection Strip in Tube ☐ Marks/Chatter ☐ Turning Sequence ☐ Wave/Twist in Tube	General ☐ Bend ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Burrs ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Drawing ☐ Drill Holes ☐ Finish ☐ Fit/Function	☐ Folio/Program ☐ Grain ☐ Hardware ☐ Inspection Incomplete/Unqualified ☐ Instructions Incomplete/Unclear ☐ Misaligned/off center ☐ Mislabeled ☐ Misread ☐ Off-set ☐ Out of Calibration ☐ Out of Sequence	☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Positioned Wrong ☐ Power Loss/Surge ☐ Pressure/Forced ☐ Set-up ☐ Temperature/Cure ☐ Weld ☐ Wrong Stock Pulled ☐ Other
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Skid-tube ☐	Crosstube ☐	Water Jet ☐	Engineering ☐															
Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐															
Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐															
Large Fab ☐	Composite ☐	Supplier ☐																

Root Cause	Date	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
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Doc/Data									
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Work Order ID 122839

Tuesday, July 29, 2014 3:34:49 PM

122839

Page 6

Item ID: D412-664-403 Accept *N900040100* Setup Start *NS1*
 Revision ID: Stop *NS2*
 Item Name: 412 Stainless Steel Aft Crosstubes - High
 Start Date: 7/29/2014 Start Qty: 1.00 *1* Cust Item ID:
 Required Date: 8/8/2014 Req'd Qty: 1.00 *1* Customer:
 Reference: RMA RA111748

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start *NR1*
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
360		0.00							

360

Crosstubes

Crosstubes

Memo

0.00

1- Install center support using scoth-weld DP460 per QSI 015, as per DWG. note 12. Install supports clamps using as per Dwg D412-644-443. Install clamp with rubber cushion as per DWG. note 13. ***ENSURE CLAMPS ARE ON TOP OF CROSSTUBE SUPPORT*** Torque clamps on support to 80-100 IN-LBS AS PER DWG.

A/R scoth-weld DP460 BATCH #: _____
 EXP DATE: _____

2- **IF NOT ALREADY PRESENT ON CHAFFING SHEILD.** Apply a thin coat of proseal 890 per QSI 015 on inside concave surface of chafing shield and let cure per manufacturer's instructions. Install prosealed chafing shield onto crosstube by applying a thin coat of proseal 890 onto crosstube. Be sure to eliminate any air gaps. Install and torque clamps on chafing shield to 40-50 IN-LBS AS PER DWG.

A/R Proseal 890 Batch: _____
 EXP DATE: _____

AFTER FINISH CURE TIME 24H

START CURE TIME: _____

FINISH CURE TIME: _____

PRIOR TO PACKAGING RE-CHECK TORQUE ON CLAMPS AFTER CURED FOR 24H.

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS <table style="width:100%;"> <tr> <td>Skid-tube ☐</td> <td>Crosstube ☐</td> <td>Water Jet ☐</td> <td>Engineering ☐</td> </tr> <tr> <td>Machining ☐</td> <td>Small Fab ☐</td> <td>Prod. Eng. Coord. ☐</td> <td>Quality ☐</td> </tr> <tr> <td>Thermoforming ☐</td> <td>Finishing ☐</td> <td>Rec/Store/Packaging ☐</td> <td>Other ☐</td> </tr> <tr> <td>Large Fab ☐</td> <td>Composite ☐</td> <td>Supplier ☐</td> <td></td> </tr> </table>	Skid-tube ☐	Crosstube ☐	Water Jet ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	Large Fab ☐	Composite ☐	Supplier ☐	
Skid-tube ☐	Crosstube ☐	Water Jet ☐	Engineering ☐															
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Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐															
Large Fab ☐	Composite ☐	Supplier ☐																

Root Cause	Date	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design									
Doc/Data									
Equip/Tooling									
Handling/Pre									
Material									
Operator									
Offset/Setup									
Process									
Supplier									
Training									
Transport									
Unapproved									

FAULT CATEGORY

Landing Gear ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Inspection Strip in Tube ☐ Marks/Chatter ☐ Turning Sequence ☐ Wave/Twist in Tube	General ☐ Bend ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Burrs ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Drawing ☐ Drill Holes ☐ Finish ☐ Fit/Function	☐ Folio/Program ☐ Grain ☐ Hardware ☐ Inspection Incomplete/Unqualified ☐ Instructions Incomplete/Unclear ☐ Misaligned/off center ☐ Mislabeled ☐ Misread ☐ Off-set ☐ Out of Calibration ☐ Out of Sequence	☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Positioned Wrong ☐ Power Loss/Surge ☐ Pressure/Forced ☐ Set-up ☐ Temperature/Cure ☐ Weld ☐ Wrong Stock Pulled ☐ Other
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DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Crosstube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐
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Root Cause	Date	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design									
Doc/Data									
Equip/Tooling									
Handling/Pre									
Material									
Operator									
Offset/Setup									
Process									
Supplier									
Training									
Transport									
Unapproved									

FAULT CATEGORY

Landing Gear ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Inspection Strip in Tube ☐ Marks/Chatter ☐ Turning Sequence ☐ Wave/Twist in Tube	General ☐ Bend ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Burrs ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Drawing ☐ Drill Holes ☐ Finish ☐ Fit/Function	☐ Folio/Program ☐ Grain ☐ Hardware ☐ Inspection Incomplete/Unqualified ☐ Instructions Incomplete/Unclear ☐ Misaligned/off center ☐ Mislabeled ☐ Misread ☐ Off-set ☐ Out of Calibration ☐ Out of Sequence	☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Positioned Wrong ☐ Power Loss/Surge ☐ Pressure/Forced ☐ Set-up ☐ Temperature/Cure ☐ Weld ☐ Wrong Stock Pulled ☐ Other
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Tuesday, July 29, 2014 3:34:49 PM

Page 8

Accept

Setup **Start** ***NS1***

Stop *NS2*

Start Date: 7/29/2014 **Start Qty:** 1.00 ***1***

Cust Item ID:

Required Date: 8/8/2014 **Req'd Qty:** 1.00 *** 1 ***

Customer:

Reference: RMA RA111748

Approvals: **Process Plan:** _____ **Date:** _____ **Tooling:** _____ **Date:** _____

Run Start *NR1*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop *NR2*

[illegible]

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Crosstube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐
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Root Cause	Date	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design									
Doc/Data									
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FAULT CATEGORY

Landing Gear ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Inspection Strip in Tube ☐ Marks/Chatter ☐ Turning Sequence ☐ Wave/Twist in Tube	General ☐ Bend ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Burrs ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Drawing ☐ Drill Holes ☐ Finish ☐ Fit/Function	☐ Folio/Program ☐ Grain ☐ Hardware ☐ Inspection Incomplete/Unqualified ☐ Instructions Incomplete/Unclear ☐ Misaligned/off center ☐ Mislabeled ☐ Misread ☐ Off-set ☐ Out of Calibration ☐ Out of Sequence	☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Positioned Wrong ☐ Power Loss/Surge ☐ Pressure/Forced ☐ Set-up ☐ Temperature/Cure ☐ Weld ☐ Wrong Stock Pulled ☐ Other
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Tuesday, July 29, 2014 3:22:14 PM

122839

D412-664-403

Required Date: 8/8/2014

Required Qty: 1.00

Comments: IPP REV:A 13.10.25 NEW ISSUE DD VERF:JLM

[illegible]

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS <table style="width: 100%;"> <tr> <td>Skid-tube ☐</td> <td>Crosstube ☐</td> <td>Water Jet ☐</td> <td>Engineering ☐</td> </tr> <tr> <td>Machining ☐</td> <td>Small Fab ☐</td> <td>Prod. Eng. Coord. ☐</td> <td>Quality ☐</td> </tr> <tr> <td>Thermoforming ☐</td> <td>Finishing ☐</td> <td>Rec/Store/Packaging ☐</td> <td>Other ☐</td> </tr> <tr> <td>Large Fab ☐</td> <td>Composite ☐</td> <td>Supplier ☐</td> <td></td> </tr> </table>	Skid-tube ☐	Crosstube ☐	Water Jet ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	Large Fab ☐	Composite ☐	Supplier ☐	
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Design									
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Equip/Tooling									
Handling/Pre									
Material									
Operator									
Offset/Setup									
Process									
Supplier									
Training									
Transport									
Unapproved									

FAULT CATEGORY

Landing Gear ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Inspection Strip in Tube ☐ Marks/Chatter ☐ Turning Sequence ☐ Wave/Twist in Tube	General ☐ Bend ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Burrs ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Drawing ☐ Drill Holes ☐ Finish ☐ Fit/Function	☐ Folio/Program ☐ Grain ☐ Hardware ☐ Inspection Incomplete/Unqualified ☐ Instructions Incomplete/Unclear ☐ Misaligned/off center ☐ Mislabeled ☐ Misread ☐ Off-set ☐ Out of Calibration ☐ Out of Sequence	☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Positioned Wrong ☐ Power Loss/Surge ☐ Pressure/Forced ☐ Set-up ☐ Temperature/Cure ☐ Weld ☐ Wrong Stock Pulled ☐ Other
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Picklist Print

Tuesday, July 29, 2014 3:22:15 PM

Page 2

Work Order ID: 122839

122839

Parent Item: D412-664-403

D412-664-403

Parent Item Name: 412 Stainless Steel Aft Crosstubes - High

Start Date: 7/29/2014

Required Date: 8/8/2014

Start Qty: 1.00

Required Qty: 1.00

D3595-063-530

Manufactured No

Each

150.0000

2

D3595-063-530

Rubber Cushion

Location

Loc Qty

Loc Code

FG

5

82656

5

LG051

145

110937

2

111194

6

113291

8

113930

5

117571

124

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Crosstube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐
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Root Cause	Date	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design									
Doc/Data									
Equip/Tooling									
Handling/Pre									
Material									
Operator									
Offset/Setup									
Process									
Supplier									
Training									
Transport									
Unapproved									

FAULT CATEGORY

Landing Gear ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Inspection Strip in Tube ☐ Marks/Chatter ☐ Turning Sequence ☐ Wave/Twist in Tube	General ☐ Bend ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Burrs ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Drawing ☐ Drill Holes ☐ Finish ☐ Fit/Function	☐ Folio/Program ☐ Grain ☐ Hardware ☐ Inspection Incomplete/Unqualified ☐ Instructions Incomplete/Unclear ☐ Misaligned/off center ☐ Mislabeled ☐ Misread ☐ Off-set ☐ Out of Calibration ☐ Out of Sequence	☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Positioned Wrong ☐ Power Loss/Surge ☐ Pressure/Forced Set-up ☐ Temperature/Cure ☐ Weld ☐ Wrong Stock Pulled ☐ Other
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Picklist Print

Tuesday, July 29, 2014 3:22:16 PM

Work Order ID: 122839

122839

Parent Item: D412-664-403

D412-664-403

Parent Item Name: 412 Stainless Steel Aft Crosstubes - High

Start Date: 7/29/2014

Required Date: 8/8/2014

Start Qty: 1.00

Required Qty: 1.00

D412-664-203

Manufactured No

Each

16.0000

1

D412-664-203

Aft Crosstube - High

Location

Loc Qty

Loc Code

FG	2	
106075	1	
107612	1	
FG098	9	
114223	1	
114634	1	
114636	1	
114826	1	
114827	1	
115203	1	
115204	1	
115206	1	
115291	1	
FG103	5	
110857	1	
115345	1	
116608	1	
116610	1	
116611	1	

1 x 118428
MF
14-7-29

D4910-1

Manufactured No

Each

10.0000

2

D4910-1

Chaffing Shield

Location

Loc Qty

Loc Code

LG043	10	
121993	10	

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS <table style="width: 100%;"> <tr> <td>Skid-tube ☐</td> <td>Crosstube ☐</td> <td>Water Jet ☐</td> <td>Engineering ☐</td> </tr> <tr> <td>Machining ☐</td> <td>Small Fab ☐</td> <td>Prod. Eng. Coord. ☐</td> <td>Quality ☐</td> </tr> <tr> <td>Thermoforming ☐</td> <td>Finishing ☐</td> <td>Rec/Store/Packaging ☐</td> <td>Other ☐</td> </tr> <tr> <td>Large Fab ☐</td> <td>Composite ☐</td> <td>Supplier ☐</td> <td></td> </tr> </table>	Skid-tube ☐	Crosstube ☐	Water Jet ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	Large Fab ☐	Composite ☐	Supplier ☐	
Skid-tube ☐	Crosstube ☐	Water Jet ☐	Engineering ☐															
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Large Fab ☐	Composite ☐	Supplier ☐																

Root Cause	Date	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design									
Doc/Data									
Equip/Tooling									
Handling/Pre									
Material									
Operator									
Offset/Setup									
Process									
Supplier									
Training									
Transport									
Unapproved									

FAULT CATEGORY

Landing Gear ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Inspection Strip in Tube ☐ Marks/Chatter ☐ Turning Sequence ☐ Wave/Twist in Tube	General ☐ Bend ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Burrs ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Drawing ☐ Drill Holes ☐ Finish ☐ Fit/Function	☐ Folio/Program ☐ Grain ☐ Hardware ☐ Inspection Incomplete/Unqualified ☐ Instructions Incomplete/Unclear ☐ Misaligned/off center ☐ Mislabeled ☐ Misread ☐ Off-set ☐ Out of Calibration ☐ Out of Sequence
		☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Positioned Wrong ☐ Power Loss/Surge
		☐ Pressure/Forced Set-up ☐ Temperature/Cure ☐ Weld ☐ Wrong Stock Pulled ☐ Other

Picklist Print

Tuesday, July 29, 2014 3:22:16 PM

Page 4

Work Order ID: 122839

122839

Parent Item: D412-664-403

D412-664-403

Parent Item Name: 412 Stainless Steel Aft Crosstubes - High

Start Date: 7/29/2014

Required Date: 8/8/2014

Start Qty: 1.00

Required Qty: 1.00

MS21042L6

Purchased

No

Each

493.0000

18

MS21042L6

Nut

Location

Loc Qty

Loc Code

ST307

493

m127831

23

m128635

3

m129499

267

m129909

200

MS21920-26

Purchased

No

Each

80.0000

4

MS21920-26

Clamp

Location

Loc Qty

Loc Code

LG050

80

107545

11

107974

20

109206

49

MS21920-28

Purchased

No

Each

103.0000

2

MS21920-28

Clamp

Location

Loc Qty

Loc Code

FG

1

105884

1

LG050

98

M128363

1

M128771

21

M128772

3

M129279

73

Return2014

4

128717

4

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS <table style="width: 100%;"> <tr> <td>Skid-tube ☐</td> <td>Crosstube ☐</td> <td>Water Jet ☐</td> <td>Engineering ☐</td> </tr> <tr> <td>Machining ☐</td> <td>Small Fab ☐</td> <td>Prod. Eng. Coord. ☐</td> <td>Quality ☐</td> </tr> <tr> <td>Thermoforming ☐</td> <td>Finishing ☐</td> <td>Rec/Store/Packaging ☐</td> <td>Other ☐</td> </tr> <tr> <td>Large Fab ☐</td> <td>Composite ☐</td> <td>Supplier ☐</td> <td></td> </tr> </table>	Skid-tube ☐	Crosstube ☐	Water Jet ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	Large Fab ☐	Composite ☐	Supplier ☐	
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Doc/Data									
Equip/Tooling									
Handling/Pre									
Material									
Operator									
Offset/Setup									
Process									
Supplier									
Training									
Transport									
Unapproved									

FAULT CATEGORY

Landing Gear ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Inspection Strip in Tube ☐ Marks/Chatter ☐ Turning Sequence ☐ Wave/Twist in Tube	General ☐ Bend ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Burrs ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Drawing ☐ Drill Holes ☐ Finish ☐ Fit/Function	☐ Folio/Program ☐ Grain ☐ Hardware ☐ Inspection Incomplete/Unqualified ☐ Instructions Incomplete/Unclear ☐ Misaligned/off center ☐ Mislabeled ☐ Misread ☐ Off-set ☐ Out of Calibration ☐ Out of Sequence	☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Positioned Wrong ☐ Power Loss/Surge ☐ Pressure/Forced ☐ Set-up ☐ Temperature/Cure ☐ Weld ☐ Wrong Stock Pulled ☐ Other
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REQUIRES INSP

Wildcat Helicopters Inc.

600TH SINCE NEW.

A.M.O. APPROVAL No: 85-99

W/O No

NOMENCLATURE AFT EXT HIGH CROSS TUBE

PART No D412-596-203

MAKE DART

MODEL or TYPE EXT HIGH

SERIAL No B100654

A/C REG WTIQ

TIME REMOVED 20634.7

HOLD FOR INSP

S.R.M. REF

REASON FOR REMOVAL HIGH GEAR INSTALL STANDARD

DATE SEPT 25 2014

SIGN

[Signature]

REPAIRABLE

NOMENCLATURE 39" AFT CROSS TUBE
 PART NUMBER D412-596-203
 SERIAL NUMBER B100654

NOTICE: WHEN RETURNING ANY LIMITED LIFE COMPONENT TO BHTC/BHTI FOR ANY REASON IT IS MANDATORY THAT A VALID HISTORICAL SERVICE RECORD ACCOMPANY THE COMPONENT

HISTORICAL SERVICE RECORD

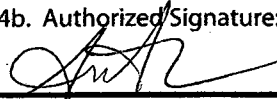
INSTALLATION DATA						SCHEDULED REMOVAL		REMOVAL DATA					
DATE	INSTALLED ON A/C NO.	BY (ACTIVITY)	INSTALLED AT	COMPONENT HOURS/RIN				DATE	REMOVED AT	COMP HRS	COMP OH	REASON FOR REMOVAL	
				SINCE NEW	SINCE O/H					SINCE NEW	SINCE O/H		
			A/C HOURS	HRS COMP. HRS	HRS COMP. HRS					INSP. HRS	RETIR. HRS / YEARS		A/C HOURS
			Landings	Landings		O/H HRS	RETIR. RIN / DATE				RIN		
27 Aug 2013	F07K	WHI	23307.5	216			/	31 Oct 2013	23341.3	36.4		Return to Dent Aerospace.	
			1453	5			/		1591	143			
31 Oct 2013	F07Q	WHI	20777.6	36.4			/	Oct 2014	20634.7	493.5			
			1996	143			/		3018	1165			
							/						
							/						
							/						
							/						
							/						
							/						

TECHNICAL DIRECTIVES AND HISTORY OF OVERHAUL

COMPONENT TOTAL TIME/RIN	DESCRIPTION OF WORK ACCOMPLISHED HISTORY OF INSPECTION, OVERHAUL, REPAIR AND APPLICATION OF TECHNICAL BULLETIN, SERVICE BULLETIN, AIRWORTHINESS DIRECTIVES, ETC.	SIGNATURE AFFIRMS WORK PERFORMED IN ACCORDANCE WITH APPLICABLE AIRWORTHINESS STANDARD		
		SIGNATURE	NO. CERT. NO	DATE
0.0	Purchased New on Wildcat Po 202579	<i>[Signature]</i>		

REFER TO APPLICABLE ASB, ADs AND SECTION 4 OF THE MAINTENANCE MANUAL FOR COMPONENT AIRWORTHINESS LIMITATIONS AND RIN(Retirement Index Number).

[illegible]

1. Approving National Authority/Country Transport Canada		Authorized Release Certificate FORM ONE		3. Form Tracking Number 50490.1	
4. Approved Organization Name and Address Eagle Copters Maintenance Ltd. 823 McTavish Road NE, Calgary, Alberta, Canada, T2E 7G9				5. Work Order/Contract/Invoice 50490	
6. Item 1	7. Description 39" Aft. Crosstube	8. Part Number D412-596-203	9. Quantity 1	10. Serial Number/ Lot Number B100654	11. Status/Work insp. / Tested
12. Remarks Above Crosstube P/N D412-596-203 was removed from A/C C-GUNQ on June 9, 2013. Crosstube was assembled and inspected on Dart Aerospace Work Order 100654. Crosstube to installed according to the latest IIN-D205-594 Rev. E, and maintained according to ICA-D205-594 Rev. 4. Time Since New: 2.6 hrs. Time Since Overhaul: N/A Other: N/A					
13a. Certifies that the items identified above were manufactured in conformity to: Approved Design data and are in condition for safe operation Non approved design data specified in block 13			14a. ☒ CAR 571.10 Maintenance Release ☐ Other regulations specified in block 12 Certifies that, unless otherwise specified in block 12, the work identified in block 11 and described in block 12 has been performed in compliance with the Canadian Aviation Regulations		
13b. Authorized Signature		13c. Certificate/Approval Number		14b. Authorized Signature:  	
13d. Name		13e. Date		14c. Certificate/Approval Number: TC AMO Approval No. 6-81 14d. Name: Patrick Smith 14e. Date (mm/dd/yyyy) 08/06/2013	
Installer Responsibilities This certificate does not constitute authority to install. Installers working in accordance with the national regulations of a country other than that specified in block 1 must ensure that their regulations recognize certifications from the country specified. Statements in blocks 13a and 14a do not constitute installation certification. In all cases, the technical record for the aircraft must contain an installation certification issued in accordance with the applicable national regulations before the aircraft may be flown.					

INSTALLED ON C-FWJTK @ 03307.5 TAFT 1453 FLIGHTS
27 AUG 2013 LOG PAGE 3410

RA 111748 D412-664-203

B109981

Received @ Dart may 12th, 2014
Inspected@ Dart June 17th, 2014

Customer:????
Customer contact:????
Shipped from:????

Instructions for RA 111748 D412-664-203 B109981 Rev PA2

- Cross tube was sent out for trial / flight testing
- Was sent out on prototype ARC
- **Preform re work as per RS 1018**
- Outside finish is damaged
 - Needs to be striped
 - Re-primed
 - Needs to be re-painted as per QSI 005
- Re-assemble as per released drawing
- Will need all new hardware for kit
- Needs new labels & paper works

Time Estimate = 5 HOURS

Departments Required: Finishing & Packaging

Pictures Attached = N/A

QTY INSPECTED = D412-664-403 B109981 Rev PA2

**THIS INSTRUCTION SHEET MUST
BE ATTACHED TO THE**

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Crosstube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐
--	--	---

Root Cause	Date	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design									
Doc/Data									
Equip/Tooling									
Handling/Pre									
Material									
Operator									
Offset/Setup									
Process									
Supplier									
Training									
Transport									
Unapproved									

FAULT CATEGORY

Landing Gear ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Inspection Strip in Tube ☐ Marks/Chatter ☐ Turning Sequence ☐ Wave/Twist in Tube	General ☐ Bend ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Burrs ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Drawing ☐ Drill Holes ☐ Finish ☐ Fit/Function	☐ Folio/Program ☐ Grain ☐ Hardware ☐ Inspection Incomplete/Unqualified ☐ Instructions Incomplete/Unclear ☐ Misaligned/off center ☐ Mislabeled ☐ Misread ☐ Off-set ☐ Out of Calibration ☐ Out of Sequence	☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Positioned Wrong ☐ Power Loss/Surge ☐ Pressure/Forced ☐ Set-up ☐ Temperature/Cure ☐ Weld ☐ Wrong Stock Pulled ☐ Other
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DART AEROSPACE LTD		Work Order:	
Description: D412-664-203 B109981 RA 111748			
Drawing: D412-664-443 REV A		Repair Scheme:	RS1018
Part No: D412-664-443		Page:	1 of 1
Batch No:		Qty:	1

Step	Location	Procedure	By	Date	Qty
1	QC	Inspect RA 111748			
2	Finishing	Remove all hardware & D4910-1 Chafing Shields Remove D4909-1 & clean all adhesive from it *re identify D4909-1 B109972 *scrap all other hardware			
3	Finishing	Strip all paint and primer as Per QSI 005			
4	QC 15	Measure all Dimensions of cross tube and Fill out FAI			
5	Purchasing	Preform LPI inspection on 100% of tube PO# _____			
6	QC 6	Inspect			
7	Purchasing	Send tube for stress relief PO# _____			
8	QC 12	Receive inspect			
9	QC 15	Measure all Dimensions of cross tube and Fill out FAI			
10	Purchasing	Preform LPI inspection on 100% of tube PO# _____			
11	QC 6	Inspect			
12	Finishing	Prime as per Drawing & Per QSI 005			
13	Finishing	Paint as per Drawing & Per QSI 005 *mask Center strip *			
14	QC 14	Inspect paint			
15	Finishing	Re assemble as per Drawing			
16	QC 5	Inspect assembly			
17	Stores	Pick Kit			
18	QC 4	Inspect kit			
19	Stores	Packaging as per PPP			
20	QC 21				

Rev	Date	Change Description	Prepared	Checked	Approved
A	14.7.15	New Issue	ED		

U:\Admin\Forms\RepairschemblA.doc

Rev. A

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Crosstube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐
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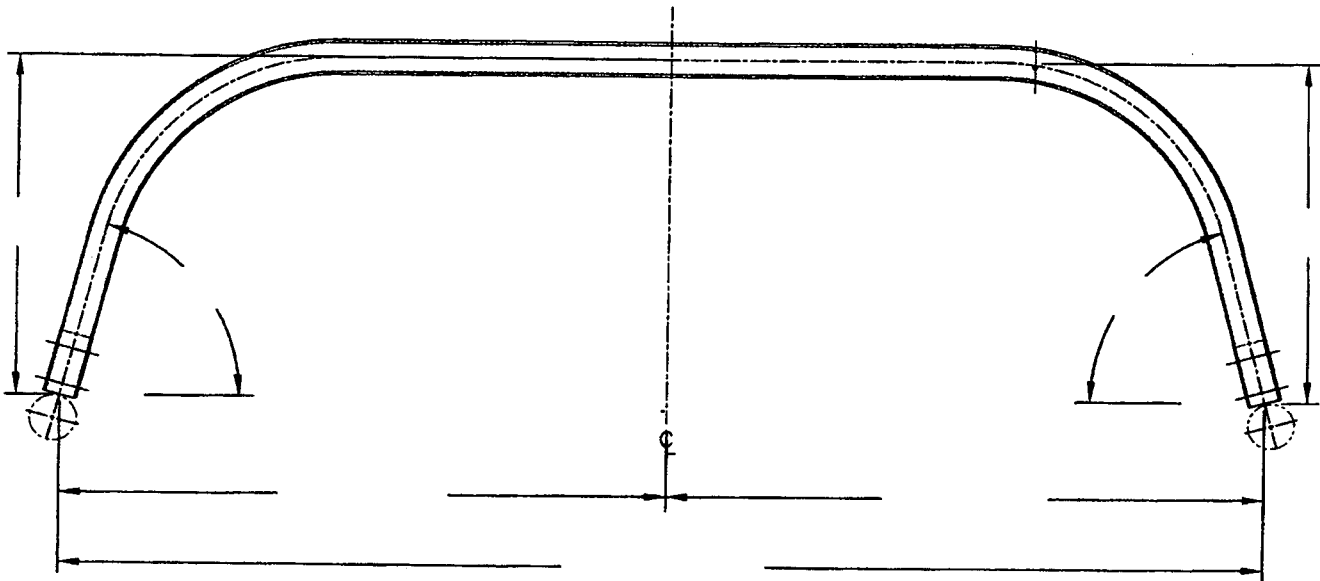
Root Cause	Date	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design									
Doc/Data									
Equip/Tooling									
Handling/Pre									
Material									
Operator									
Offset/Setup									
Process									
Supplier									
Training									
Transport									
Unapproved									

FAULT CATEGORY

Landing Gear ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Inspection Strip in Tube ☐ Marks/Chatter ☐ Turning Sequence ☐ Wave/Twist in Tube	General ☐ Bend ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Burrs ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Drawing ☐ Drill Holes ☐ Finish ☐ Fit/Function	☐ Folio/Program ☐ Grain ☐ Hardware ☐ Inspection Incomplete/Unqualified ☐ Instructions Incomplete/Unclear ☐ Misaligned/off center ☐ Mislabeled ☐ Misread ☐ Off-set ☐ Out of Calibration ☐ Out of Sequence	☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Positioned Wrong ☐ Power Loss/Surge ☐ Pressure/Forced ☐ Set-up ☐ Temperature/Cure ☐ Weld ☐ Wrong Stock Pulled ☐ Other
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DART AEROSPACE LTD		Work Order:	
Description: Crosstube High Aft (412)		Part Number:	D412-664-403
Inspection Dwg: D412-664-443 Rev: A		Page 1 of 1	

Required Dimension	Min	Max
Height	24.12	24.62
1/2 Span	53.56	53.82
Angle	49°	52°
Total Span	107.12	107.64
Bending Passes	8	--
Crushing	--	7%



	Side A	Side B
Bending Passes		
Crushing		
Comments		

QC15 Inspection	
Date	

Rev	Date	Change	Revised by	Approved
A	14.07.08	New Issue	KJ <i>[Signature]</i>	<i>[Signature]</i>

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS <table style="width: 100%;"> <tr> <td>Skid-tube ☐</td> <td>Crosstube ☐</td> <td>Water Jet ☐</td> <td>Engineering ☐</td> </tr> <tr> <td>Machining ☐</td> <td>Small Fab ☐</td> <td>Prod. Eng. Coord. ☐</td> <td>Quality ☐</td> </tr> <tr> <td>Thermoforming ☐</td> <td>Finishing ☐</td> <td>Rec/Store/Packaging ☐</td> <td>Other ☐</td> </tr> <tr> <td>Large Fab ☐</td> <td>Composite ☐</td> <td>Supplier ☐</td> <td></td> </tr> </table>	Skid-tube ☐	Crosstube ☐	Water Jet ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	Large Fab ☐	Composite ☐	Supplier ☐	
Skid-tube ☐	Crosstube ☐	Water Jet ☐	Engineering ☐															
Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐															
Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐															
Large Fab ☐	Composite ☐	Supplier ☐																

Root Cause	Date	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design									
Doc/Data									
Equip/Tooling									
Handling/Pre									
Material									
Operator									
Offset/Setup									
Process									
Supplier									
Training									
Transport									
Unapproved									

FAULT CATEGORY

Landing Gear ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Inspection Strip in Tube ☐ Marks/Chatter ☐ Turning Sequence ☐ Wave/Twist in Tube	General ☐ Bend ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Burrs ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Drawing ☐ Drill Holes ☐ Finish ☐ Fit/Function	☐ Folio/Program ☐ Grain ☐ Hardware ☐ Inspection Incomplete/Unqualified ☐ Instructions Incomplete/Unclear ☐ Misaligned/off center ☐ Mislabeled ☐ Misread ☐ Off-set ☐ Out of Calibration ☐ Out of Sequence	☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Positioned Wrong ☐ Power Loss/Surge ☐ Pressure/Forced ☐ Set-up ☐ Temperature/Cure ☐ Weld ☐ Wrong Stock Pulled ☐ Other
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**skyservice****Work Order Traveler**

Sky Service F.B.O. Inc.

Page: 1 of 2

DOT APP 53-89 / EASA 145.7142 / BDA AMO 385

WO #: MWO21600	Customer: Dart Aerospace Ltd.	Dept: NDT YUL	Reference: 25145
Descr:	PN:	S/N:	Qty: 1
Make:	Model:	Reg:	A/C S/N:
TSN: 0	CSN: 0	TSO: 0	
Task: UNSCHEDULED			Sequence: 1

Work Required:

CARRY OUT NDT INSPECTION (LIQUID PENETRANT) ON 7 CROSSTUBES + 49 MISC PARTS

ITEM ID: D416-664-203 AFT CROSSTUBE - HIGH

1 - WORK ORDER ID#: 118426

ITEM ID: D206-667-210 AFT CROSSTUBE

2 - WORK ORDER ID#: 120854

3 - WORK ORDER ID#: 120855

4 - WORK ORDER ID#: 120856

5 - WORK ORDER ID#: 120857

6 - WORK ORDER ID#: 120858

7 - WORK ORDER ID#: 120859

ID#: D4883-1 END FITING (QTY 17)

8 - WORK ORDER ID#: 121609

ID#: D4883-7 END FITING (QTY 5)

9 - WORK ORDER ID#: 121409

ID#: D4883-3 END FITING (QTY 15)

10 - WORK ORDER ID#: 121567

ID#: D4883-3 END FITING (QTY 6)

11 - WORK ORDER ID#: 126039

ID#: D4883-5 END FITING (QTY 6)

12 - WORK ORDER ID#: 121523

Action Taken:	Date:	Initial/Stamp:
LIQUID PENETRANT INSPECTION CARRIED OUT ON ITEMS LISTED ABOVE (ITEMS 1-12) AS PER ASTM1417M-13 NO CRACK FOUND Pen: ZL-56 BATCH# 09H094 EXP. DATE: AUG 2014, DEV: SKD-S2 EXP. DATE: OCT2017 CLEANER: SKC-S EXP. DATE: APR 2018	JUL 24 2014	

I certified that the maintenance described above has been performed in accordance with the applicable standard of airworthiness.

Signature:	ACA/SCA Stamp	Date:
Name: ANTONINO MARCHETTA		JUL 24 2014

Work Order ID 118426

Tuesday, July 29, 2014 3:29:02 PM

118426

Page 1

Item ID: D412-664-203

Accept

N900040100Setup Start ***NS1***

Revision ID:

Item Name: Aft Crosstube - High

Stop ***NS2***

Start Date: 7/8/2014 Start Qty: 1.00

1

Cust Item ID:

Required Date: 7/9/2014 Req'd Qty: 1.00

1

Customer: CDART02

Reference: RMA RA111748

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	Revision Nbr								
D412-664-243	F								

100

0.00

100

QC

Quality Control

Memo

0.00

INSPECT RA 111748
D412-664-203 X 1 B109981

NEEDS TO BE REWORKED PER RS1018

110

0.00

110

HandFinish

Hand Finishing

Memo

0.00

REMOVE ALL HARDWARE & D4910-1 AND SCRAP

REMOVE D4909-1 X 1 B109972 AND SET ASIDE , CLEAN ALL
ADHESIVE FROM IT

STRIP ALL PAINT AND PRIMER PER QSI 005

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS <table style="width:100%;"> <tr> <td>Skid-tube ☐</td> <td>Crosstube ☐</td> <td>Water Jet ☐</td> <td>Engineering ☐</td> </tr> <tr> <td>Machining ☐</td> <td>Small Fab ☐</td> <td>Prod. Eng. Coord. ☐</td> <td>Quality ☐</td> </tr> <tr> <td>Thermoforming ☐</td> <td>Finishing ☐</td> <td>Rec/Store/Packaging ☐</td> <td>Other ☐</td> </tr> <tr> <td>Large Fab ☐</td> <td>Composite ☐</td> <td>Supplier ☐</td> <td></td> </tr> </table>	Skid-tube ☐	Crosstube ☐	Water Jet ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	Large Fab ☐	Composite ☐	Supplier ☐	
Skid-tube ☐	Crosstube ☐	Water Jet ☐	Engineering ☐															
Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐															
Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐															
Large Fab ☐	Composite ☐	Supplier ☐																

Root Cause	Date	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design ☐									
Doc/Data ☐									
Equip/Tooling ☐									
Handling/Pre ☐									
Material ☐									
Operator ☐									
Offset/Setup ☐									
Process ☐									
Supplier ☐									
Training ☐									
Transport ☐									
Unapproved ☐									

FAULT CATEGORY

Landing Gear ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Inspection Strip in Tube ☐ Marks/Chatter ☐ Turning Sequence ☐ Wave/Twist in Tube	General ☐ Bend ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Burrs ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Drawing ☐ Drill Holes ☐ Finish ☐ Fit/Function	☐ Folio/Program ☐ Grain ☐ Hardware ☐ Inspection Incomplete/Unqualified ☐ Instructions Incomplete/Unclear ☐ Misaligned/off center ☐ Mislabeled ☐ Misread ☐ Off-set ☐ Out of Calibration ☐ Out of Sequence	☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Positioned Wrong ☐ Power Loss/Surge ☐ Pressure/Forced ☐ Set-up ☐ Temperature/Cure ☐ Weld ☐ Wrong Stock Pulled ☐ Other
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Work Order ID 118426

118426

Page 2

Tuesday, July 15, 2014 2:51:46 PM

Item ID: D412-664-203

Accept

N900040100

Setup Start *NS1*

Revision ID:

Stop *NS2*

Item Name: Aft Crosstube - High

Start Date: 7/8/2014 Start Qty: 1.00

1

Cust Item ID:

Required Date: 7/9/2014 Req'd Qty: 1.00

1

Customer: CDART02

Reference: RMA RA111748

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start *NR1*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

120

QC15- Crosstube Dimensional Check

0.00

120

QC

Memo

0.00

Quality Control

MEASURE ALL DIMENSIONS OF CROSSTUBE AND FILL OUT FAI

130

Outsource process - NDT per QSI038 4.1

0.00

130

Outsource2

Memo

0.00

Outsource process - NDT

ISSUE P/O TO ACCUREN:

25/45

PERFORM LPI INSPECTION ON 100% OF TUBE

CY 14/07/25 ①

140

QC6- Inspect dimensions to drawing

0.00

140

QC

Memo

0.00

Quality Control

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Crosstube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐
--	--	---

Root Cause	Date	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design									
Doc/Data									
Equip/Tooling									
Handling/Pre									
Material									
Operator									
Offset/Setup									
Process									
Supplier									
Training									
Transport									
Unapproved									

FAULT CATEGORY

Landing Gear ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Inspection Strip in Tube ☐ Marks/Chatter ☐ Turning Sequence ☐ Wave/Twist in Tube	General ☐ Bend ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Burrs ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Drawing ☐ Drill Holes ☐ Finish ☐ Fit/Function	☐ Folio/Program ☐ Grain ☐ Hardware ☐ Inspection Incomplete/Unqualified ☐ Instructions Incomplete/Unclear ☐ Misaligned/off center ☐ Mislabeled ☐ Misread ☐ Off-set ☐ Out of Calibration ☐ Out of Sequence	☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Positioned Wrong ☐ Power Loss/Surge ☐ Pressure/Forced ☐ Set-up ☐ Temperature/Cure ☐ Weld ☐ Wrong Stock Pulled ☐ Other
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Work Order ID 118426

Tuesday, July 15, 2014 2:51:46 PM

118426

Page 3

Item ID: D412-664-203 Accept *N900040100* Setup Start *NS1*
 Revision ID: Stop *NS2*
 Item Name: Aft Crosstube - High
 Start Date: 7/8/2014 Start Qty: 1.00 *1* Cust Item ID:
 Required Date: 7/9/2014 Req'd Qty: 1.00 *1* Customer: CDART02
 Reference: RMA RA111748

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start *NR1*
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
150		0.00							
150									
Outsource1	Memo	0.00							
Outsource process - Heat Treat	ISSUE P/O TO METCOR: <u>25216</u>								
	Stress relief								
	975° For 2 hours ALLOW TO AIR COOL AT AMBIANT TEMP.								
160	Receive & Inspect for Damage & Mat'l Certs	0.00							
160									
Packaging	Memo	0.00							
Packaging									
170	QC15- Crosstube Dimensional Check	0.00							
170									
QC	Memo	0.00							
Quality Control	MEASURE AL DIMENSIONS OF CROSS TUBE AND FILL OUT FAI								

14/07/30 ①

19/7/5 ①

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Crosstube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐
--	--	---

Root Cause	Date	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design									
Doc/Data									
Equip/Tooling									
Handling/Pre									
Material									
Operator									
Offset/Setup									
Process									
Supplier									
Training									
Transport									
Unapproved									

FAULT CATEGORY

Landing Gear ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Inspection Strip in Tube ☐ Marks/Chatter ☐ Turning Sequence ☐ Wave/Twist in Tube	General ☐ Bend ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Burrs ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Drawing ☐ Drill Holes ☐ Finish ☐ Fit/Function	☐ Folio/Program ☐ Grain ☐ Hardware ☐ Inspection Incomplete/Unqualified ☐ Instructions Incomplete/Unclear ☐ Misaligned/off center ☐ Mislabeled ☐ Misread ☐ Off-set ☐ Out of Calibration ☐ Out of Sequence	☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Positioned Wrong ☐ Power Loss/Surge ☐ Pressure/Forced ☐ Set-up ☐ Temperature/Cure ☐ Weld ☐ Wrong Stock Pulled ☐ Other
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Work Order ID 118426

Tuesday, July 15, 2014 2:51:46 PM

118426

Page 4

Item ID: D412-664-203 Accept ***N900040100*** Setup Start ***NS1***
Revision ID: Stop ***NS2***
Item Name: Aft Crosstube - High
Start Date: 7/8/2014 Start Qty: 1.00 ***1*** Cust Item ID:
Required Date: 7/9/2014 Req'd Qty: 1.00 ***1*** Customer: CDART02
Reference: RMA RA111748

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
180	Outsource process - NDT per QSI038 4.1	0.00							
180									
Outsource2	Memo	0.00							
Outsource process - NDT	ISSUE P/O TO ACCUREN: _____								
	PERFORM LPI INSPECTION ON 100% OF TUBE								
190	QC6- Inspect dimensions to drawing	0.00							
190									
QC	Memo	0.00							
Quality Control									
200		0.00							
200									
SprayPaint	Memo	0.00							
Spray Painting	1-Prime inside & outside crosstube as per QSI 005 4.2 BATCH: _____								
	2- MASK UNDERSIDE OF CROSSTUBE AS SHOWN ON DWG BEFORE PAINTING								

See attached

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Crosstube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐
--	--	---

Root Cause	Date	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design									
Doc/Data									
Equip/Tooling									
Handling/Pre									
Material									
Operator									
Offset/Setup									
Process									
Supplier									
Training									
Transport									
Unapproved									

FAULT CATEGORY

Landing Gear ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Inspection Strip in Tube ☐ Marks/Chatter ☐ Turning Sequence ☐ Wave/Twist in Tube	General ☐ Bend ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Burrs ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Drawing ☐ Drill Holes ☐ Finish ☐ Fit/Function	☐ Folio/Program ☐ Grain ☐ Hardware ☐ Inspection Incomplete/Unqualified ☐ Instructions Incomplete/Unclear ☐ Misaligned/off center ☐ Mislabeled ☐ Misread ☐ Off-set ☐ Out of Calibration ☐ Out of Sequence	☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Positioned Wrong ☐ Power Loss/Surge ☐ Pressure/Forced ☐ Set-up ☐ Temperature/Cure ☐ Weld ☐ Wrong Stock Pulled ☐ Other
--	--	---	--

Work Order ID 118426

Tuesday, July 15, 2014 2:51:46 PM

118426

Page 5

Item ID: D412-664-203

Accept

N900040100

Setup Start

NS1

Revision ID:

Item Name: Aft Crosstube - High

Stop

NS2

Start Date: 7/8/2014 Start Qty: 1.00

1

Cust Item ID:

Required Date: 7/9/2014 Req'd Qty: 1.00

1

Customer: CDART02

Reference: RMA RA111748

Approvals:

Process Plan: _____

Date: _____

Tooling: _____

Date: _____

Run Start

NR1

QC: _____

Date: _____

SPC (Y/N): _____

Date: _____

Stop

NR2Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

210

QC14- Inspect Spray Paint

0.00

210

QC

Memo

0.00

Quality Control

220

220

Crosstubes

Memo

0.00

Crosstubes

as per Dwg D412-644-443. Install clamp with rubber cushion as per DWG. note
13. ***ENSURE CLAMPS ARE ON TOP OF CROSSTUBE SUPPORT***
Torque clamps on support to 80-100 IN-LBS AS PER DWG.

A/R scoth-weld DP460

BATCH #:

EXP DATE:

2- **IF NOT ALREADY PRESENT ON CHAFFING SHEILD.** Apply a thin
coat of proseal 890 per QSI 015 on inside concave surface of chafing shield and
let cure per manufacturer's instructions. Install prosealed chafing shield onto
crosstube by applying a thin coat of proseal 890 onto crosstube. Be sure to
eliminate any air gaps. Install and torque clamps on chafing shield to 40-50 IN-
LBS AS PER DWG.

A/R Proseal 890

Batch:

See attached

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Crosstube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐
--	--	---

Root Cause	Date	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design									
Doc/Data									
Equip/Tooling									
Handling/Pre									
Material									
Operator									
Offset/Setup									
Process									
Supplier									
Training									
Transport									
Unapproved									

FAULT CATEGORY

Landing Gear ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Inspection Strip in Tube ☐ Marks/Chatter ☐ Turning Sequence ☐ Wave/Twist in Tube	General ☐ Bend ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Burrs ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Drawing ☐ Drill Holes ☐ Finish ☐ Fit/Function	☐ Folio/Program ☐ Grain ☐ Hardware ☐ Inspection Incomplete/Unqualified ☐ Instructions Incomplete/Unclear ☐ Misaligned/off center ☐ Mislabeled ☐ Misread ☐ Off-set ☐ Out of Calibration ☐ Out of Sequence	☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Positioned Wrong ☐ Power Loss/Surge ☐ Pressure/Forced ☐ Set-up ☐ Temperature/Cure ☐ Weld ☐ Wrong Stock Pulled ☐ Other
--	--	---	--

Tuesday, July 15, 2014 2:51:46 PM

Page 6

NS1

NS2

NR1

NR2

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
230	QC5- Inspect part completeness to step on W/O	0.00							
230									
QC	Memo	0.00							
Quality Control									
240	Pick Kit	0.00							
240									
Packaging	Memo	0.00							
Packaging									
250	QC4- 100% Inspect kits for completeness	0.00							
250									
QC	Memo	0.00							
Quality Control									

see attached

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Crosstube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐
--	--	---

Root Cause	Date	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design									
Doc/Data									
Equip/Tooling									
Handling/Pre									
Material									
Operator									
Offset/Setup									
Process									
Supplier									
Training									
Transport									
Unapproved									

FAULT CATEGORY

Landing Gear ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Inspection Strip in Tube ☐ Marks/Chatter ☐ Turning Sequence ☐ Wave/Twist in Tube	General ☐ Bend ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Burrs ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Drawing ☐ Drill Holes ☐ Finish ☐ Fit/Function	☐ Folio/Program ☐ Grain ☐ Hardware ☐ Inspection Incomplete/Unqualified ☐ Instructions Incomplete/Unclear ☐ Misaligned/off center ☐ Mislabeled ☐ Misread ☐ Off-set ☐ Out of Calibration ☐ Out of Sequence	☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Positioned Wrong ☐ Power Loss/Surge ☐ Pressure/Forced ☐ Set-up ☐ Temperature/Cure ☐ Weld ☐ Wrong Stock Pulled ☐ Other
--	--	---	--

Work Order ID 118426

Tuesday, July 15, 2014 2:51:46 PM

118426

Page 7

Item ID: D412-664-203

Accept

N900040100Setup Start ***NS1***

Revision ID:

Item Name: Aft Crosstube - High

Stop ***NS2***

Start Date: 7/8/2014 Start Qty: 1.00

1

Cust Item ID:

Required Date: 7/9/2014 Req'd Qty: 1.00

1

Customer: CDART02

Reference: RMA RA111748

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
260	Identify as per dwg & Stock Location: _____	0.00							
260									
Packaging	Memo	0.00							
Packaging									
270	QC21- Final Inspection - Work Order Release	0.00							
270									
QC	Memo	0.00							
Quality Control									

change to.
122839
D412-664-463

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Crosstube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐
--	--	---

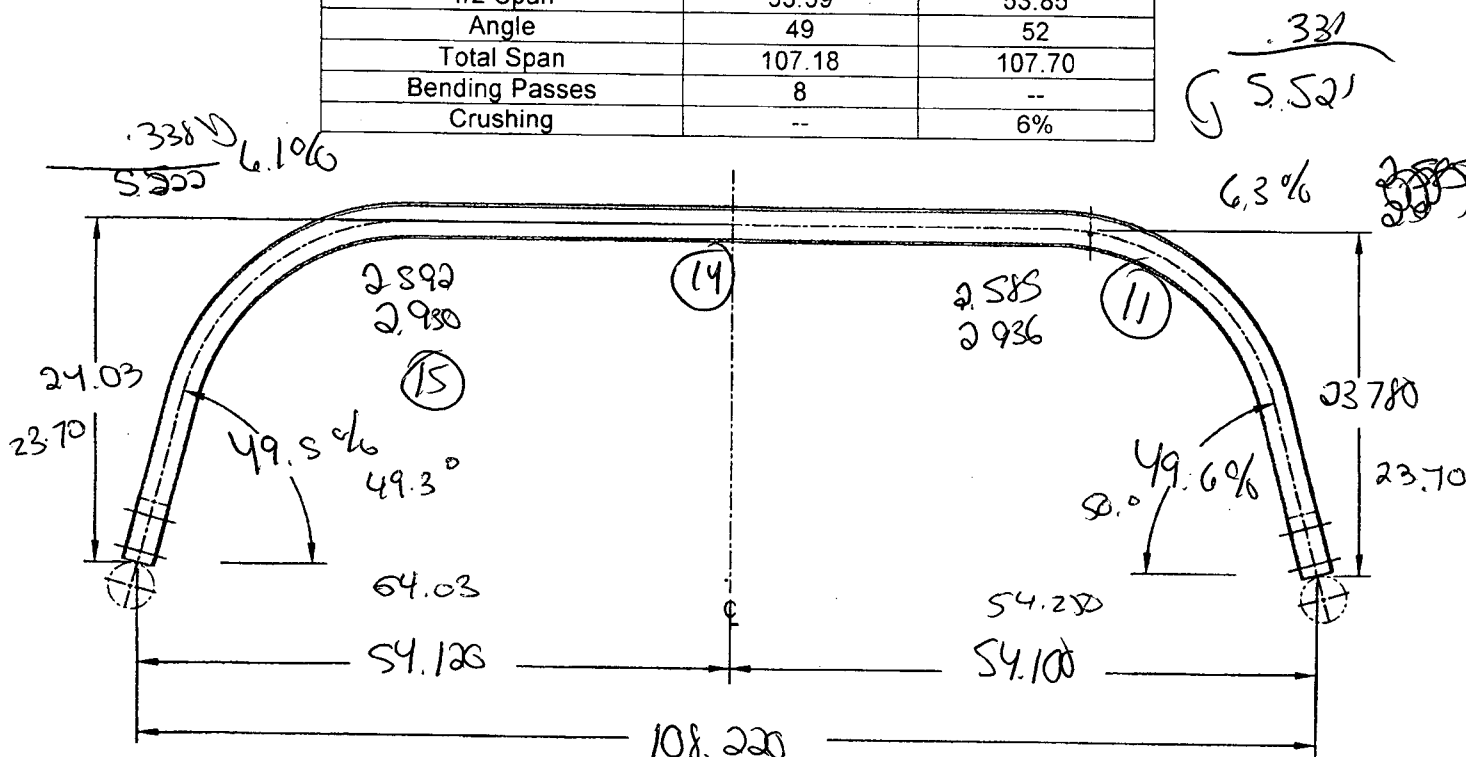
Root Cause	Date	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design									
Doc/Data									
Equip/Tooling									
Handling/Pre									
Material									
Operator									
Offset/Setup									
Process									
Supplier									
Training									
Transport									
Unapproved									

FAULT CATEGORY

Landing Gear ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Inspection Strip in Tube ☐ Marks/Chatter ☐ Turning Sequence ☐ Wave/Twist in Tube	General ☐ Bend ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Burrs ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Drawing ☐ Drill Holes ☐ Finish ☐ Fit/Function	☐ Folio/Program ☐ Grain ☐ Hardware ☐ Inspection Incomplete/Unqualified ☐ Instructions Incomplete/Unclear ☐ Misaligned/off center ☐ Mislabeled ☐ Misread ☐ Off-set ☐ Out of Calibration ☐ Out of Sequence	☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Positioned Wrong ☐ Power Loss/Surge ☐ Pressure/Forced ☐ Set-up ☐ Temperature/Cure ☐ Weld ☐ Wrong Stock Pulled ☐ Other
--	--	---	--

DART AEROSPACE LTD		Work Order:	
Description: Crosstube High Aft (412)		Part Number:	D412-664-203
Inspection Dwg: D412-664-243 Rev: E		Page 1 of 1	

Required Dimension	Min	Max
Height	24.24	24.50
1/2 Span	53.59	53.85
Angle	49	52
Total Span	107.18	107.70
Bending Passes	8	--
Crushing	--	6%



	Side A	Side B
Bending Passes	15	11
Crushing	6.1%	6.3%
Comments		
Side A	15 passes	6.1% crushing
middle	14 passes	
Side B	11 passes	6.3% crushing

QC15 Inspection	
Date	

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	07.05.08	Dimensions updated per Dwg rev. D	KJ/JLM	
C	10.02.02	Dwg Rev updated	KJ	
D	12.04.16	Added bending, crushing dimensions	KJ	1P

Work Order ID 109981

December-11-13 10:38:07 AM

109981

PRELIMINARY ISSUE

Page 1

Item ID: D412-664-403

Accept

N900040100

Setup Start *NS1*

Revision ID:

Stop *NS2*

Item Name: Crosstube

Start Date: 12/11/13 Start Qty: 1.00

1

Cust Item ID:

Required Date: 12/19/13 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: N Date: _____ Tooling: _____ Date: _____

Run Start *NR1*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	Revision Nbr								
D412-664-443	A2								

100
100
DC
Document Control

DOCUMENT CONTROL

Memo
Photocopy bluefile & type labels per PPPD412-664-403 CHG001

0.00

110
110
CNC Bend 2
CNC Alpha 160 Bender

BENDING MACHINE - CROSSTUBES

Memo
Bend tube as per Dwg D412-664-443 using CNC bender program _____ and Folio FT _____

****USE (4) DT9824 SHIM BLOC TO CHECK STRAIGHTNESS****

0.00

TW 13-12-12

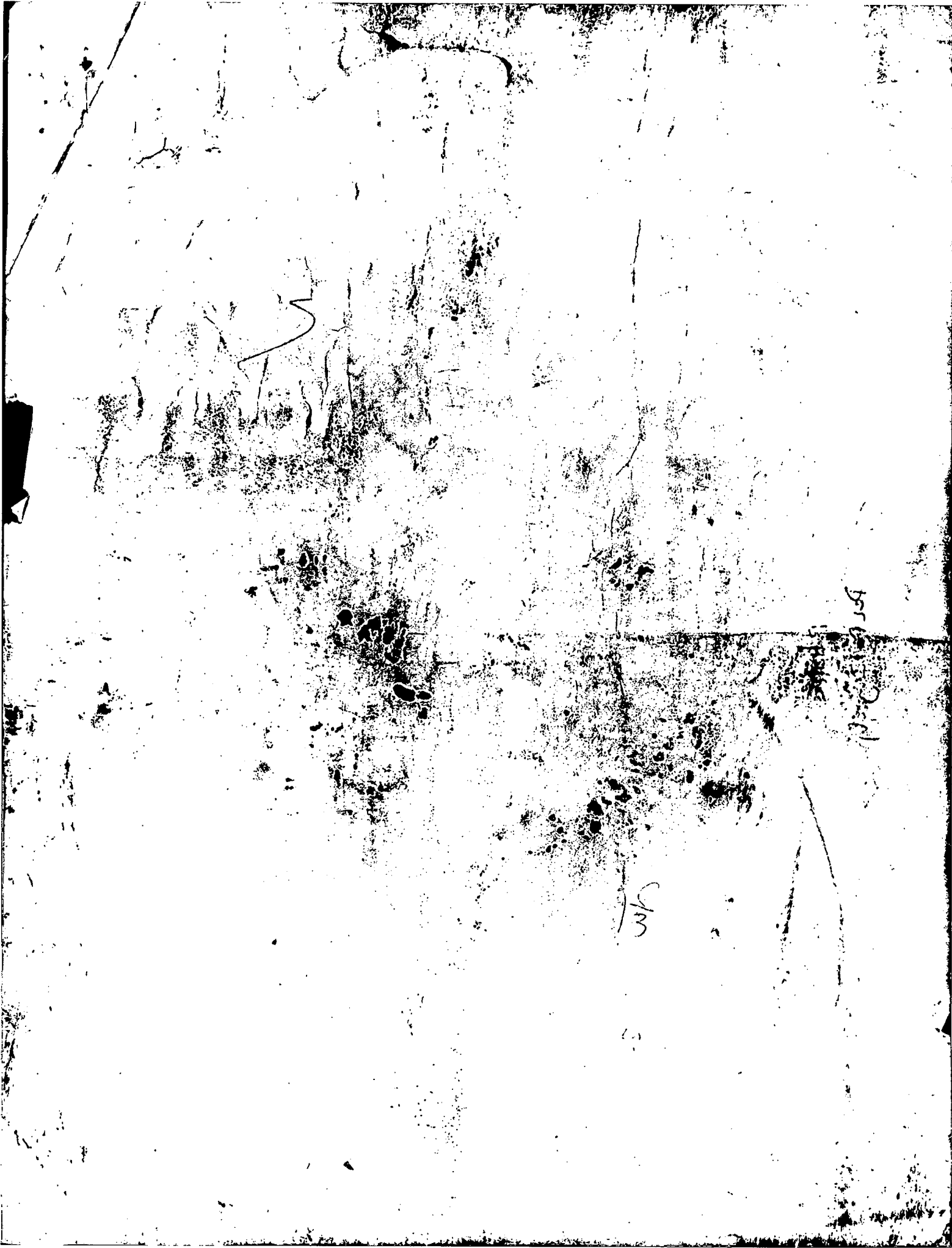
127
127
QC
Quality Control

QC15- Crosstube Dimensional Check

Memo
MARK CUT LINES

0.00

16
9-89 13/12/13
Per Paz Dyal



Work Order ID 109981

December-11-13 10:38:07 AM

109981

Page 2

Item ID: D412-664-403

Accept

N900040100

Setup Start *NS1*

Revision ID:

Stop *NS2*

Item Name: Crosstube

Start Date: 12/11/13 Start Qty: 1.00

1

Cust Item ID:

Required Date: 12/19/13 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start *NR1*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

128

0.00

128

Crosstubes

Memo

0.00

Crosstubes

CUT TUBE AT HEIGHT ON FAI SHEET

VERF HEIGHT 21.370" BY QC 15 LEVEL INSPECTOR JS

VERF TWIST 0.049" BY QC15 LEVEL INSPECTOR JS 13/12/16

130

0.00

130

Crosstubes

Crosstubes

Memo

0.00

Crosstubes

1- Drill Tube as per Dwg D412-664-443 Using DT _____ Drill Jigs,
Set-up drill table as per QSI 010

2 -Deburr

3- Engrave Part # and Batch # as per Dwg D412-664-443

4-Remove all marks from tube within limits of D412-664-43 DWG.

MO / JB 13-12-16

KC 13-12-18

Work Order ID 109981

December-11-13 10:38:07 AM

109981

Page 3

Item ID: D412-664-403

Accept

N9000040100

Setup Start

NS1

Revision ID:

Stop

NS2

Item Name: Crosstube

Start Date: 12/11/13 Start Qty: 1.00

1

Cust Item ID:

Required Date: 12/19/13 Req'd Qty: 1.00

1

Customer:

Reference:

REFERENCE ONLY

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start

NR1

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

NR2

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
140	QC6- Inspect dimensions to drawing	0.00							
140									
QC	Memo	0.00							
Quality Control									
172		0.00							
172									
Crosstubes	Memo	0.00							
Crosstubes	***LOAD TEST TO 3000LB FOR 1 MINUTE***								
174	Outsource process - NDT per QSI038 4.1	0.00							
174									
Outsource2	Memo	0.00							
Outsource process - NDT	ISSUE P/O TO ACCUREN: 22756								

1
Inspect on per
Draw R2

A/A see attached

CZ 14/10/24 ①

Work Order ID 109981

December-11-13 10:38:07 AM

109981

Page 4

Item ID: D412-664-403

Accept

N900040100Setup Start ***NS1***

Revision ID:

Item Name: Crosstube

Stop ***NS2***

Start Date: 12/11/13 Start Qty: 1.00

1

Cust Item ID:

Required Date: 12/19/13 Req'd Qty: 1.00

1

Customer:

Reference:

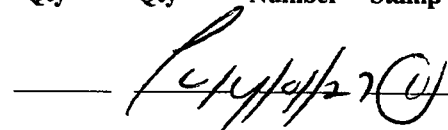
Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
176	Receive & Inspect for Damage & Mat'l Certs	0.00							
176									
Packaging	Memo	0.00							
Packaging									
178	QC5- Inspect part completeness to step on W/O	0.00							
178									
QC	Memo	0.00							
Quality Control									



1 14/3/5 **DAS**
12
8-89

Work Order ID 109981

December-11-13 10:38:07 AM

109981

Page 5

Item ID: D412-664-403

Accept

N900040100

Setup Start

NS1

Revision ID:

Item Name: Crosstube

Stop

NS2

Start Date: 12/11/13 Start Qty: 1.00

1

Cust Item ID:

Required Date: 12/19/13 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start

NR1

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

NR2

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

180

0.00

180

SprayPaint

1

C.R. 2014/02/05

SprayPaint

Memo

0.00

Spray Painting

1-Prime inside & outside crosstube as per QSI 005 4.2

BATCH: 128049

2- MASK UNDERSIDE OF CROSSTUBE AS SHOWN ON DWG BEFORE PAINTING

3 -Paint Outside of Tube as per Dart QSI 005 4.2

BATCH: _____

4- After painting remove masking and apply matte clear coat per QSI005 4.2

125473

see 2H2002
may be
used for testing

190

QC14- Inspect Spray Paint

0.00

190

QC

Memo

0.00

Quality Control

1

14/03/05

Work Order ID 109981

December-11-13 10:38:07 AM

109981

Page 6

Item ID: D412-664-403

Accept

N900040100Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: Crosstube

Start Date: 12/11/13 Start Qty: 1.00

1

Cust Item ID:

Required Date: 12/19/13 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
200		0.00							
200	Crosstubes					<u>1</u>	<u>0</u>	<u>0</u>	<u>AL</u>
Crosstubes	Memo	0.00							14-2-27
Crosstubes	1- Install center support using scoth-weld DP460 per QSI 015, as per DWG. note 12. A/R scoth-weld DP460 BATCH #: <u>120005</u> <u>exp 7/14</u>								
	2- Install clamp with rubber cushion as per DWG. note 13								
	3- Abrade mating surfaces of support and crosstube with 400 grit sandpaper, clean the area with 4105S wash 'n' wipe								
	4- **IF NOT ALREADY PRESENT ON CHAFFING SHEILD.** Apply a thin coat of proseal 890 per QSI 015 on inside concave surface of chafing shield and let cure per manufacturer's instructions. Install prosealed chafing shield onto crosstube by applying a thin coat of proseal 890 onto crosstube. Be sure to eliminate any air gaps. A/R Proseal 890 Batch: <u>127662</u> <u>exp 4/14</u>								
	5- Install supports clamps using <u>DXC</u> as per Dwg D412-644-443, Torque clamps on support to 80-100 IN-LBS. Torque clamps on chafing shield to 40-50 IN-LBS.								
	START CURE TIME: <u>12:45</u> FINISH CURE TIME: <u>1:30</u>								
	PRIOR TO PACKAGING RE-CHECK TORQUE ON CLAMPS AFTER CURED FOR 24H.								

Work Order ID 109981

December-11-13 10:38:07 AM

109981

Page 7

Item ID: D412-664-403

Accept

N900040100

Setup Start *NS1*

Revision ID:

Stop *NS2*

Item Name: Crosstube

Start Date: 12/11/13 Start Qty: 1.00 *1*

Cust Item ID:

Required Date: 12/19/13 Req'd Qty: 1.00 *1*

Customer:

Reference:

REFERENCE ONLY

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start *NR1*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

210	QC5- Inspect part completeness to step on W/O	0.00				1			14.03.03
210									
QC	Memo	0.00							

Quality Control PRIOR TO PACKAGING RE-CHECK TORQUE ON CLAMPS AFTER CURED FOR 24H.

220	Pick Kit	0.00							
-----	----------	------	--	--	--	--	--	--	--

220						1X	DAS 28 9-89	14-03-5	
Packaging	Memo	0.00							

Packaging

SEE ATTACHED

230	QC4- 100% Inspect kits for completeness	0.00							
-----	---	------	--	--	--	--	--	--	--

230									DAS 12 9-89
QC	Memo	0.00						14/3/5	

Quality Control

14.03.03

Work Order ID 109981

December-11-13 10:38:07 AM

109981

Page 8

Item ID: D412-664-403

Accept

N900040100

Setup Start

NS1

Revision ID:

Item Name: Crosstube

Stop

NS2

Start Date: 12/11/13 Start Qty: 1.00

1

Cust Item ID:

Required Date: 12/19/13 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start

NR1

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

NR2

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
240		0.00			DAS				
240	Packaging				6				
Packaging	Memo	0.00			9-89	14-3-10		8	
Packaging	Identify and pack for shipping as per PPPD412-664-443								
	Location: _____								
	PPP Rev: _____								
250	QC21- Final Inspection - Work Order Release	0.00							
250									
QC	Memo	0.00							
Quality Control									

POSITIVE RECALL

EFFECTIVE 3.12.11 AUTH W

RELEASED _____ DATE _____

Picklist Print

December-11-13 10:38:06 AM

Page 1

Work Order ID: 109981
Parent Item: D412-664-403
Parent Item Name: Crosstube

Start Date: 12/11/13 Required Date: 12/19/13
Start Qty: 1.00 Required Qty: 1.00

Comments: IPP REV:A 13.10.25 NEW ISSUE DD VERF:JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D3595-063-530 Rubber Cushion		Manufactured	No				Each	170.0000		2		14-2-27	
				<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>							
				FG	5								
				82656	5								
				LG050	34								
				103099	8								
				106512	26								
				LG051	131								
				101880	4								
				103949	30								
				63407	6								
				67185	6								
				70067	18								
				72745	2								
				75783	7								
				79932	13								
				82656	10								
				87833	5								
				90969	21								
				99914	9								
D412-664-443TRN Crosstube Turning Detail		Manufactured	No				Each	0.0000		1			
D4909-1 Support		Manufactured	No	109972			Each	0.0000		① 1	AS	14-2-27	
D4910-1 Chaffing Shield		Manufactured	No	109900			Each	1.0000		② 2	AS	14-2-27	
				<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>							
				LG052	1								
				106427	1								

DEPENDENT ONLY

110937

109891 2043084

Picklist Print

December-11-13 10:38:06 AM

Page 2

Work Order ID: 109981
Parent Item: D412-664-403
Parent Item Name: Crosstube

Start Date: 12/11/13

Required Date: 12/19/13

Start Qty: 1.00

Required Qty: 1.00

MS21920-26 Purchased No Each 124.0000
Clamp

4

14-2-27

Location	Loc Qty	Loc Code
LG050	124	
102290	1	
106119	16	
107545	38	
107974	21	
109206	48	

MS21920-28 Purchased No Each 100.0000
Clamp

2

14-2-27

Location	Loc Qty	Loc Code
FG	5	
105884	5	
LG050	84	
123674	10	
124505	4	
125351	8	
M125728	1	
M126085	2	
M127061	14	
M127544	45	
LG051	11	
121440	8	
123243	2	
124260	1	

December-11-13 10:38:06 AM

Shop Packet Print

Page 2

Item	Qty	Part Number	Description
	443		
1	X	D412-664-443	CROSSTUBE ASSEMBLY (412 HI AFT)
2	1	D6020-XXX	CROSSTUBE MATERIAL
3	2	D3595-063-530	RUBBER CUSHION
4	1	D4909-1	SUPPORT
5	2	D4910-1	CHAFING SHIELD
7	4	MS21920-28	CLAMP
8	2	MS21920-28	CLAMP
9	A/R	SCOTCH-WELD DP460	EPOXY ADHESIVE, 3M SCOTCH-WELD
10	A/R	PROSEAL 890	SEALANT

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6020-XXX
FINISHED LENGTH = 130.10±0.060 (BEFORE BENDING/TRIMMING)
- 2) FINISH: PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
MASK UNDERSIDE OF CROSSTUBE AS SHOWN (ZN C6-2, HATCHED AREA)
PAINT OUTSIDE PER DART QSI 005 4.2
AFTER PAINTING, REMOVE MASKING AND APPLY MATTE CLEAR COAT PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART P/N "D412-664-443" AND B/N ON INSIDE OF CUFF PER DART QSI 044 6.4 (VIBRATING STYLUS)
- 7) WEIGHT: 90.2 lb AFTER MACHINING
86.7 lb FINISHED WEIGHT
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.

BENDING

- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 7% (BASED ON O.D.) IN LOWER HALF OF R35 BEND AND 6% (BASED ON O.D.) ON REMAINING TUBE.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038. TO BE PERFORMED AFTER FINAL POST-BEND GRINDING. ANY ADDITIONAL GRINDING REQUIRES ANOTHER LPI INSPECTION.

ASSEMBLY

- 12) INSTALL D4909-1 CENTER SUPPORT USING A 0.04" TO 0.07" THICK LAYER OF SCOTCH-WELD DP460 PER QSI 015.
- 13) INSTALL MS21920-28 CLAMPS WITH D3595-063-530 RUBBER CUSHIONS TO SECURE THE D4909-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT.
- 14) IF NOT ALREADY PRESENT ON CHAFING SHIELD, APPLY A THIN COAT OF PROSEAL 890 ON INSIDE CONCAVE SURFACE OF D4910-1 CHAFING SHIELD AND LET CURE PER MANUFACTURER'S INSTRUCTIONS. INSTALL PROSEALED D4910-1 CHAFING SHIELD ONTO CROSSTUBE BY APPLYING A THIN COAT OF PROSEAL 890 ONTO CROSSTUBE. BE SURE TO ELIMINATE ANY AIR GAPS.
- 15) TORQUE CLAMPS ON D4909-1 SUPPORT 80 TO 100 IN-LB. TORQUE CLAMPS ON D4910-1 CHAFING SHIELD 40 TO 50 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER ADHESIVES HAVE CURED FOR 24 HOURS.

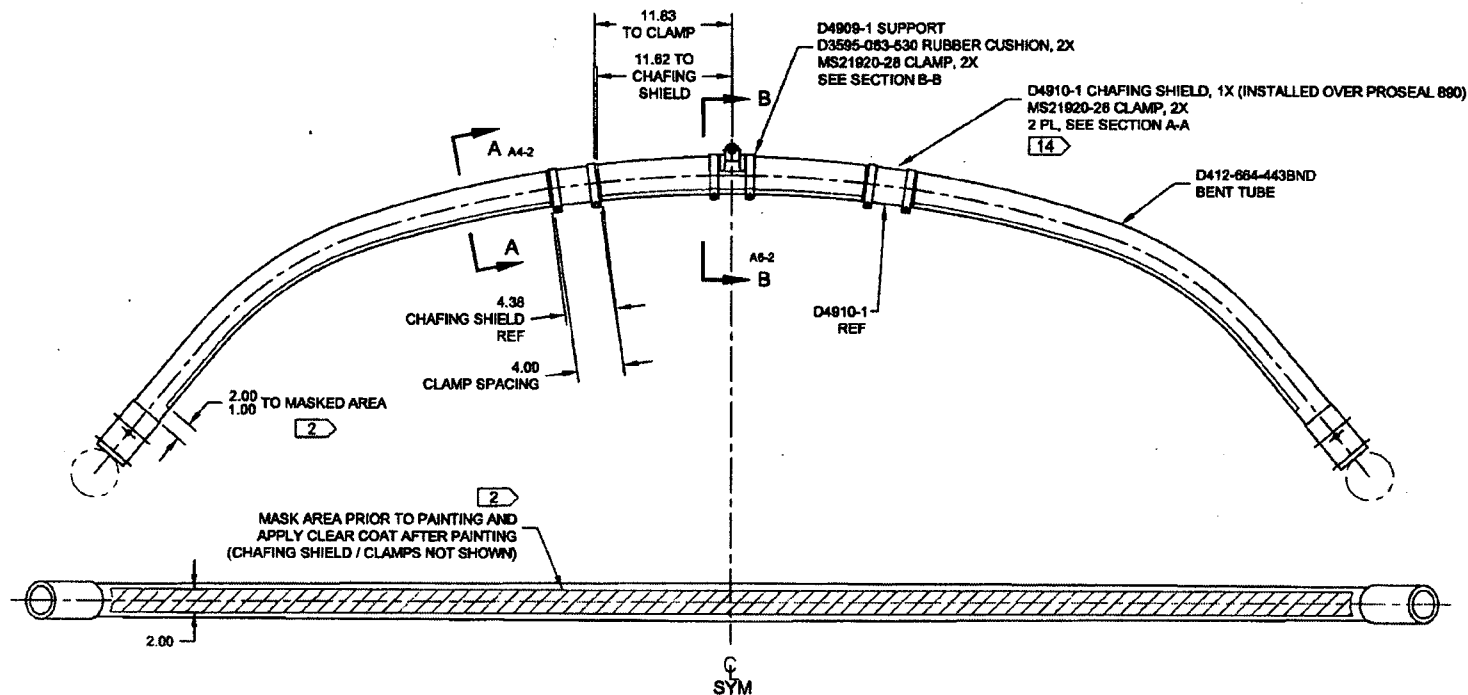
PRECEDENCE ONLY

W/O
189981

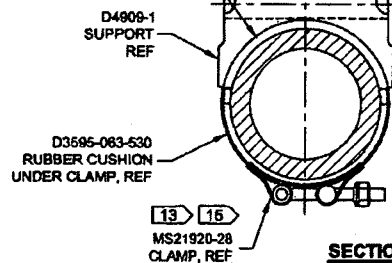
PRELIMINARY ISSUE

Rev. PAL CP 13/10/25

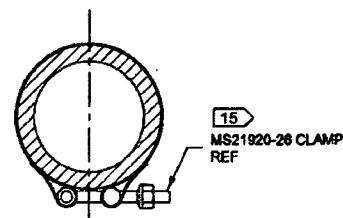
AL-	NEW ISSUE	CP	13.10.17
REV.	DESCRIPTION	BY	DATE
DESIGN	AP	DART AEROSPACE LTD	
DRAWN	AP	HAWKESBURY, ONTARIO, CANADA	
CHECKED	A.R.	DRAWING NO.	REV. A1
MFG APPR.		D412-664-443	SHEET 1 OF 4
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE ASSY (412 HI AFT)	NTS
DATE	13.10.17	COPYRIGHT © 2013 BY DART AEROSPACE LTD THIS DOCUMENT IS PROPRIETARY AND CONFIDENTIAL. IT IS SUPPLIED ON THE EXPRESS UNDERSTANDING THAT IT IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT PERMISSION FROM DART AEROSPACE LTD.	



12
APPLY 3M SCOTCH-WELD DP460
BETWEEN D4909-1 SUPPORT AND
THE CROSSTUBE



SECTION B-B
SCALE 4X

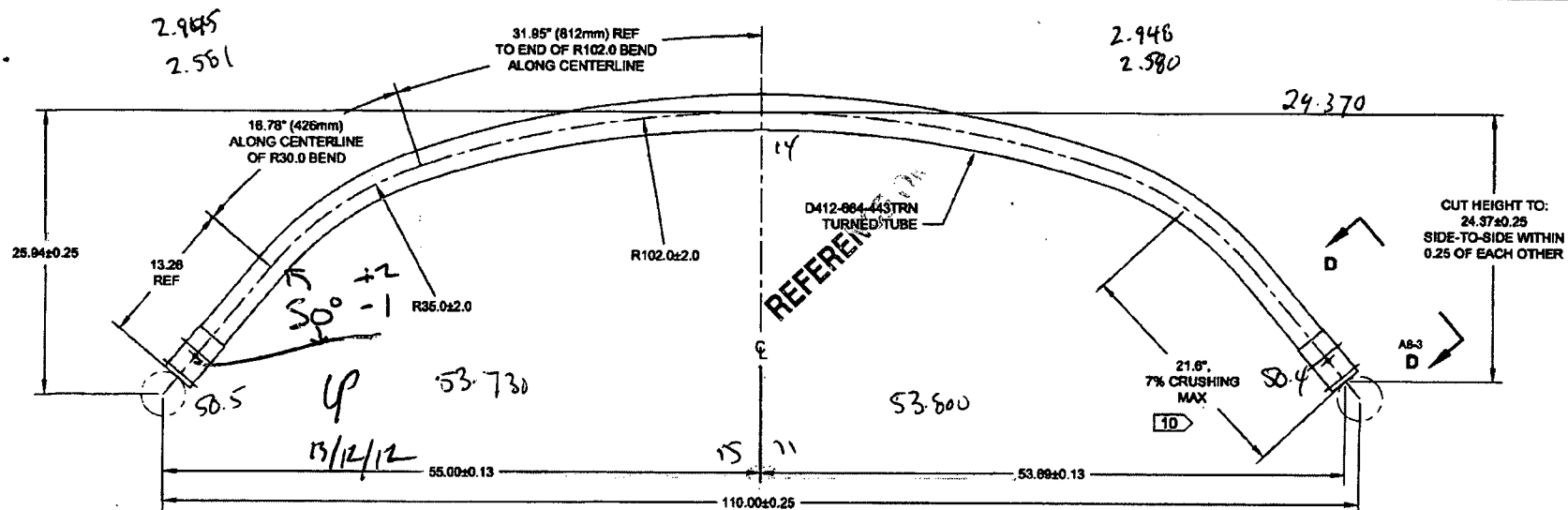


SECTION A-A
SCALE 4X

PRELIMINARY ISSUE

Rev. #12 15/10/25

DESIGN	4	DART AEROSPACE LTD	
DRAWN	4	HAWKESBURY, ONTARIO, CANADA	
CHECKED	A.P.	DRAWING NO.	REVA12
MFG. APPR.		D412-664-443	SHEET 2 OF 4
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE ASSY (412 HI AFT)	NTS
DATE	13.10.17	COPYRIGHT © 2013 BY DART AEROSPACE LTD	
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D412-664-443BND
BENDING DETAIL

10

107.320

Ø0.386^{+0.005}_{-0.005} HOLE TO BE
ALIGNED WITHIN ±0.001
OF HOLE ON OTHER SIDE
OF CUFF
2 PL

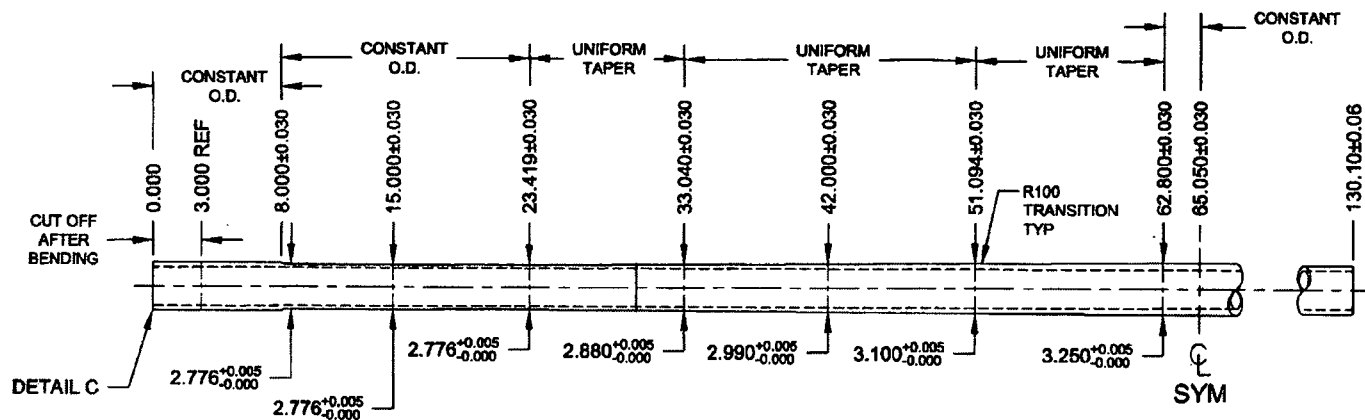
C1-3 **VIEW D-D: CUFF DETAIL**
SCALE 4X



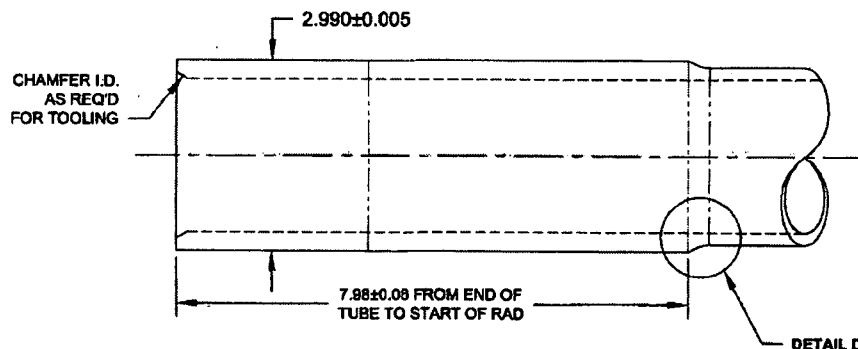
PRELIMINARY ISSUE

R. PAZ 4/13/12

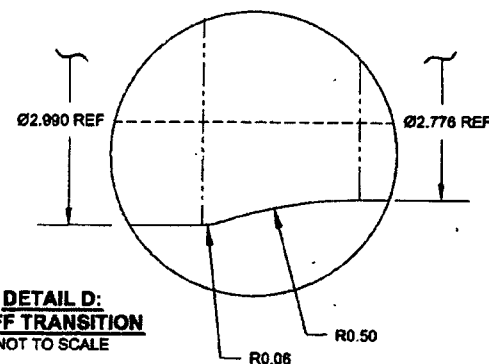
DESIGN	97	DART AEROSPACE LTD	
DRAWN	97	HAWKESBURY, ONTARIO, CANADA	
CHECKED	A.P.	DRAWING NO.	REVA2
MFG. APPR.		D412-664-443	SHEET 3 OF 4
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE ASSY (412 HI AFT)	NTS
DATE	13.10.17	COPYRIGHT © 2013 BY DART AEROSPACE LTD	
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D412-664-443TRN
TURNING DETAIL



DETAIL C:
CUFF TRANSITION
SCALE 4X



DETAIL D:
CUFF TRANSITION
NOT TO SCALE

NOTES:

- 1) MATERIAL: MAKE FROM D8020-XXX
- 2) FINISH: NONE
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: NONE
- 7) WEIGHT: 90 lbs

PRELIMINARY ISSUE

Rev. 992
4/13/10/25

DESIGN		DART AEROSPACE LTD
DRAWN		HAWKESBURY, ONTARIO, CANADA
CHECKED	A.P.	DRAWING NO. REV A1
MFG. APPR.		D412-664-443 SHEET 4 OF 4
APPROVED		TITLE SCALE
DE APPR.		CROSSTUBE ASSEMBLY (412 HI AFT) NTS
DATE	13.10.17	COPYRIGHT © 2013 BY DART AEROSPACE LTD
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三

1.75" shims are used in the buggy for side bends

Approach for middle bend is 2870 on both rollers. Run program's middle1-6 check.

Enjoy

OFFENSE ONLY

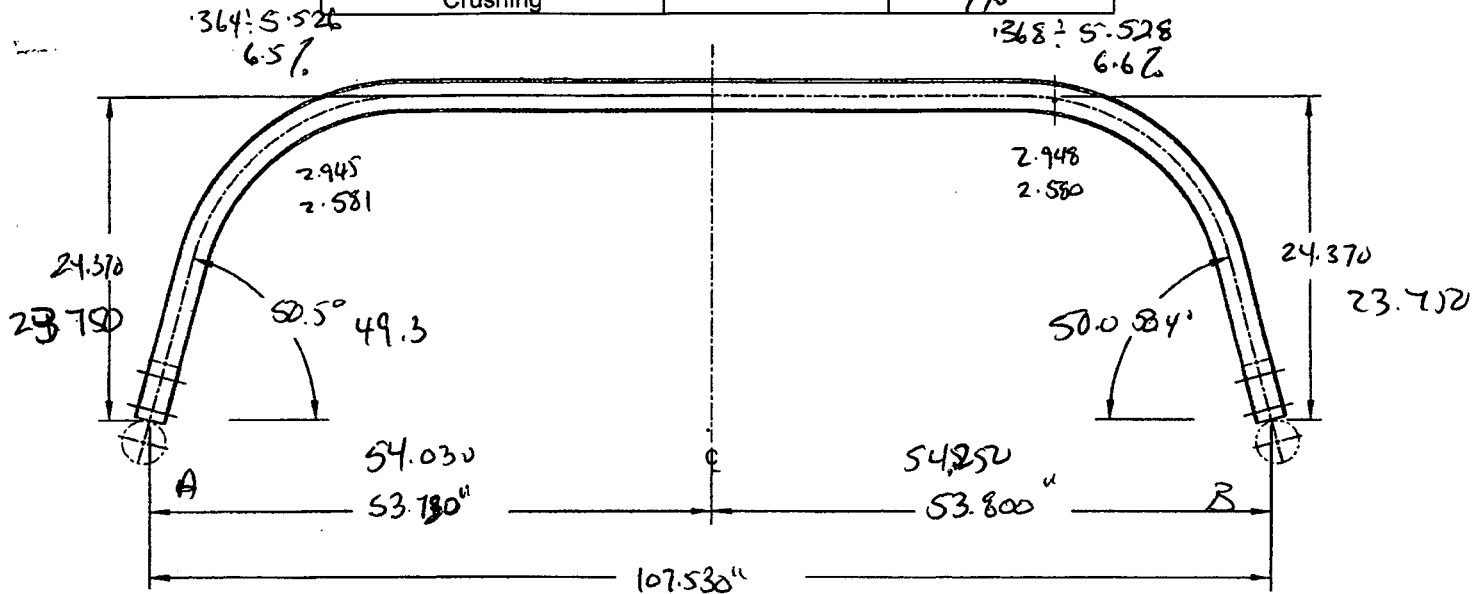
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DART AEROSPACE LTD	Work Order: 109981
Description: D42-664-443 412 High Aft	Part Number: D42-664-408
Inspection Dwg: D42-664-443 Rev: Pn2	Page 1 of 1

Required Dimension	Min	Max
Height	24.12	24.62
1/2 Span	53.56	53.82
Angle		
Total Span	107.12 +07.12	107.64 107.64
Bending Passes	8	
Crushing		7%



	Side A	Side B
Bending Passes	15	14
Crushing	6.5%	6.6%
Comments		
Side A = 6.5% crushing @ 15 Passes		
Middle = 14 Passes		
Side B = 6.6% crushing @ 11 Passes		

QC15 Inspection	DAS 16	DAS 12
Date	9-29 13/12/12	9-29 3/12/12

Rev	Date	Change	Revised by	Approved
A		New Issue		
B	06.09.19	Reformat; QC level revised	KJ/JM	
C	07.02.06	Reformat	KJ/JM	
D	12.02.15	Added bending passes and crushing	KJ	
E	12.03.07	Revised comments table	KJ	

RECEIVED ONLY

Linda Lacelle

From: Mike Petsche
Sent: January-16-14 11:19 AM
To: Linda Lacelle
Subject: RE: D412-664-403 X-TUBE FOR TESTING

Yes please

From: Linda Lacelle
Sent: Thursday, January 16, 2014 11:16 AM
To: Mike Petsche
Subject: RE: D412-664-403 X-TUBE FOR TESTING

Cool...but ndt'd, right?

From: Mike Petsche
Sent: January-16-14 10:44 AM
To: Linda Lacelle
Subject: RE: D412-664-403 X-TUBE FOR TESTING

Not

Shouldn't be on the routing

From: Linda Lacelle
Sent: Thursday, January 16, 2014 10:14 AM
To: Mike Petsche
Subject: RE: D412-664-403 X-TUBE FOR TESTING

Reminder...load test? Ndt?

From: Mike Petsche
Sent: January-16-14 9:29 AM
To: Linda Lacelle

Cc: Jean-Luc Menard; David Shepherd; Patrick Smith
Subject: RE: D412-664-403 X-TUBE FOR TESTING

Yup.

So we can proceed with the existing crosstube. We should have one Rockwell tube assembled to have a s a back-up.....(hopefully only to be used for flight test). It does not need to be painted.

From: Linda Lacelle
Sent: Thursday, January 16, 2014 8:52 AM
To: Mike Petsche
Cc: Jean-Luc Menard; David Shepherd; Patrick Smith
Subject: RE: D412-664-403 X-TUBE FOR TESTING

Hi Mike,

You were going to get back to me yesterday regarding the Rockwell tubes we have waiting. Do we proceed with one? If so, do we do the load test and ndt prior to assembling? Do we paint prior to assembling?

REFERENCE ONLY

Thx
L

From: Mike Petsche
Sent: January-13-14 11:02 AM
To: Linda Lacelle
Cc: Jean-Luc Menard; David Shepherd; Patrick Smith
Subject: RE: D412-664-403 X-TUBE FOR TESTING

Linda as discussed, Chris is digging out the results from the testing we did on the crosstube in the shed, (made from Siderval stuff). As soon as we can verify the b/n I can confirm that we don't need anything from you. (Except a fwd tube....which Dan is going to snag from stock)

From: Linda Lacelle
Sent: Monday, January 13, 2014 10:32 AM
To: Mike Petsche
Cc: Jean-Luc Menard; David Shepherd; Patrick Smith
Subject: RE: D412-664-403 X-TUBE FOR TESTING

Hi Mike,

Have you had a chance to confirm on the siderval tube? Or do I go ahead and get the Rockwell tube ass'd?

Thx

From: Mike Petsche
Sent: January-10-14 12:02 PM
To: Linda Lacelle
Cc: Jean-Luc Menard; David Shepherd; Patrick Smith
Subject: Re: D412-664-403 X-TUBE FOR TESTING

I will shortly

Sent from my iPhone

On Jan 10, 2014, at 11:15 AM, "Linda Lacelle" <llacelle@dartaero.com> wrote:

So, who can confirm on the siderval tube?
As for the fwd tube, D212-664-101, we have plenty in stk.
LL

From: Mike Petsche
Sent: January-10-14 10:58 AM
To: Linda Lacelle; Jean-Luc Menard
Cc: David Shepherd; Patrick Smith
Subject: RE: D412-664-403 X-TUBE FOR TESTING

I believe we still have a completed crosstube made from Siderval material already. (used for previous deflection testing). We can use that for the drop test. If we don't still have it, we could use the one made from Rockwell.....but that's not the preferred option \$\$\$.

Also keep in mind we will need a fwd tube for the drop test too.....

From: Linda Lacelle
Sent: Friday, January 10, 2014 10:48 AM
To: Jean-Luc Menard; Mike Petsche
Cc: David Shepherd; Patrick Smith
Subject: RE: D412-664-403 X-TUBE FOR TESTING

If we use the siderval mat'l, we would have to start from scratch, turn, grind, send for heat treat(3wks min), bend etc...the TRN'd tubes we have in stk from the siderval mat'l is for the high gear (D412-596). We DO have the two Rockwell tubes that were bent sitting over in the crosstube ass'y area, that were awaiting instruction.
Mike? David? Can you use one of those?

LL

From: Jean-Luc Menard
Sent: January-10-14 8:09 AM
To: Linda Lacelle; Mike Petsche
Cc: David Shepherd; Patrick Smith
Subject: D412-664-403 X-TUBE FOR TESTING

Hi Linda,

As discussed,eng will need 1x d412-664-403 assembled with chafing shields supports,tube is to be unpainted.

Tube is to be bent out of the Siderval material that is already turned and heat treated.

Full conformity will have to be done on the tube.

Mike,

Let us know if I missed anything.

JL

Jean-Luc Ménard
Production Engineering Supervisor

DART AEROSPACE
T 1 613 632-5200 > 227
F 1 613 632-5246
1 800 556- 4166
www.dartaerospace.com

<image001.png>

REFERENCE ONLY

skyservice Work Order Traveler

Sky Service F.B.O. Inc.

Page: 1 of 2

DOT APP 53-89 / EASA 145.7142 / BDA AMO 385

WO #: MWO19647	Customer: Dart Aerospace Ltd.	Dept: NDT YUL	Reference: PO22756
Descr:	PN:	S/N:	Qty: 1
Make:	Model:	Reg:	A/C S/N:
TSN: 0	CSN: 0	TSO: 0	
Task: UNSCHEDULED			Sequence: 1

Work Required:

CARRY OUT NDT (LIQUID PENETRANT) ON THE FOLLOWING ELEVEN CROSSTUBES:

ID# D350-748-201 AFT CROSSTUBES

1 WORK ORDER ID 104234 2-WORK ORDER ID 105305
3 WORK ORDER ID 105530 4-WORK ORDER ID 106692

ID# D350-748-101 FWD CROSSTUBES

5 WORK ORDER ID 99680 6 WORK ORDER ID 102883
7 WORK ORDER ID 104268

ID# D412-664-403 CROSSTUBES

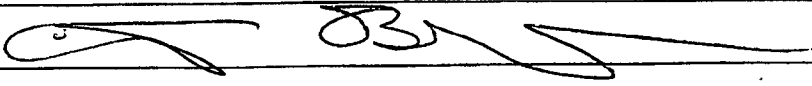
8 WORK ORDER ID 109981 9 WORK ORDER ID 109893

ID# D212-664-101 FWD CROSSTUBES-HIGH

10 WORK ORDER ID 111385 11-WORK ORDER ID 111386

Action Taken:		Date:	Initial/Stamp:		
LIQUID PENETRANT INSPECTION CARRIED OUT ON ITEMS LISTED ABOVE (ITEMS 1-11) AS PER ASTM1417M-13		23 Jan 2014			
NO CRACK FOUND					
Pen: ZL-56 BATCH# 09H094 EXP. DATE: AUG 2014, DEV: SKD-S2 EXP. DATE: OCT2017 CLEANER: SKC-S EXP. DATE: APR 2018					
Description	Location P/N	Qty	Batch	S/N Off	S/N On

I certified that the maintenance described above has been performed in accordance with the applicable standard of airworthiness.

Signature: 	ACA/SCA Stamp 	Date: 23 Jan 2014
Name: CHRISTIAN BRIEN		

DQA:

Date:

WORK ORDER NON-CONFORMANCE / UPDATE



QA Closed:

Date:

Work Order update only ☐

Work Order: _____	DISPOSITION Rework ☒ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS			
Part No. _____		Skid-tube ☐	Crosstube ☐	Water Jet ☐	Engineering ☐
NCR No. _____		Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐
		Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐
		Large Fab ☐	Composite ☐	Supplier ☐	

Root Cause	Date	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design									
Doc/Data									
Equip/Tooling	11/3/5	220	1	Pick kit per attached IIS markup.	DAS 12 9-89	ONLY (1) ANG-40A M127817 (2) ANG-41A M126180 (6) MS21042LL M127904 (13) ANG65D616 M127813	DAS 28 9-89	DAS 12 9-89 11/3/5	
Handling/Pre									
Material									
Operator									
Offset/Setup									
Process									
Supplier									
Training									
Transport									
Unapproved									

FAULT CATEGORY

Landing Gear ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Inspection Strip in Tube ☐ Marks/Chatter ☐ Turning Sequence ☐ Wave/Twist in Tube	General ☐ Bend ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Burrs ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Drawing ☐ Drill Holes ☐ Finish ☐ Fit/Function	☐ Folio/Program ☐ Grain ☐ Hardware ☐ Inspection Incomplete/Unqualified ☐ Instructions Incomplete/Unclear ☐ Misaligned/off center ☐ Mislabeled ☐ Misread ☐ Off-set ☐ Out of Calibration ☐ Out of Sequence	☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Positioned Wrong ☐ Power Loss/Surge	☐ Pressure/Forced ☐ Set-up ☐ Temperature/Cure ☐ Weld ☐ Wrong Stock Pulled ☐ Other
--	--	---	--	--

5.0 PARTS LIST

5.1 HIGH GEAR CROSSTUBES

Item	-101	-201	-203	Part Number	Description
	X		-403	D212-664-101	CROSSTUBE INSTALLATION, 204/205/210/212/214/412, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH FWD
		X		D212-664-201	CROSSTUBE INSTALLATION, 204/205/210/212/214, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH AFT
			X	D412-664-203 - 403	CROSSTUBE INSTALLATION, 412 HIGH AFT
1	1			D212-664-141	CROSSTUBE ASSEMBLY, 204/205/210/212/214/412, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH FWD
2		1		D212-664-241	CROSSTUBE ASSEMBLY, 204/205/210/212/214, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH AFT
3			1	D412-664-243	CROSSTUBE ASSEMBLY, 412 HIGH AFT
10	2			* D2893-1	SUPPORT
11	4			* D3595-063-450	RUBBER CUSHION
12	4			* MS21920-25	CLAMP (OR MS21042-26)
13	4			AN6-35A	BOLT
14	4			AN6-36A	BOLT
15	6			MS21042L6	NUT (OR MS21042-6)
16	18			AN960JD616	WASHER
20		2		* D2940-1	SUPPORT
21		4		* D3595-063-530	RUBBER CUSHION
22		4		* MS21920-28	CLAMP (OR MS21042-30)
23		4		AN6-40A	BOLT
24		2		AN6-41A	BOLT
25		6		MS21042L6	NUT (OR MS21042-6)
26		18		AN960JD616	WASHER
30			1	* D2896-1	SUPPORT
32			2	* D3595-063-570	RUBBER CUSHION
33			4	* MS21920-28	CLAMP
34			2	* MS21920-30	CLAMP (OR MS21042-32)
35			4	AN6-40A	BOLT
36			2	AN6-41A	BOLT
37			6	MS21042L6	NUT (OR MS21042-6)
38			18	AN960JD616	WASHER
39			2	* D3189-1	CHAFING SHIELD
50	1	1		D3428-1	PLACARD

*REFERENCE ONLY. PARTS ARE INCLUDED IN D212-664-141/-241 OR D412-664-243 ASSEMBLIES ABOVE
NOTE: KITS INCLUDE EXTRA HARDWARE FOR COMPATIBILITY WITH BOTH DART AND BELL/AAI
SKIDTUBES.

1. Approving Civil Aviation Authority/Country Transport Canada		2. AUTHORIZED RELEASE CERTIFICATE Form One			3. Form Tracking Number: PS-2014-03-07-1	
4. Organizations Name and Address: Dart Aerospace Ltd., 1270 Aberdeen Street, Hawkesbury, Ontario, K6A 1K7, CANADA Tel: 1 (613) 632-5200 Fax: 1 (613) 632-5246 www.dartaero.com					5. Work Order/Contract/Invoice RD5388	
6. Item:	7. Description:	8. Part Number:	9. Quantity:	10. Serial/Batch Number:	11. Status/Work:	
1	Crosstube Assembly (412 HI AFT)	D412-664-403	1	B109981	Prototype	
12. Remarks: <u>"NOT ELIGIBLE FOR INSTALLATION ON IS-SERVICE TYPE CERTIFIED AIRCRAFT"</u> <u>"THIS ITEM CONFORMS TO DATA THAT IS NOT APPROVED AT THE TIME OF RELEASE. SUBJECT TO APPROVAL OF THE DATA, THE ITEM IS IN CONDITION FOR SAFE OPERATION."</u> **FOR USE IN AIRCRAFT WITH APPROVED FLIGHT TEST PLAN ONLY**						
13a. Certifies that the items identified above were manufactured in conformity to: ☐ Approved design data and are in a condition for safe operation. ☒ Non-approved design data specified in Block 12.			14a. ☐ CAR 571.10 Maintenance Release ☐ Other regulations specified in Block 12 Certifies that unless otherwise specified in Block 12, the work identified in Block 11 and described in Block 12, has been performed in compliance with the <i>Canadian Aviation Regulations</i> .			
13b. Signature 		13c. Approval Organization Number DAG 29 9-89 9-89		14b. Signature		14c. Approved Organization Number
13d. Name Patrick Smith		13e. Date (dd/mm/yyyy): 07/Mar/2014		14d. Name		14e. Date (dd/mm/yyyy):
30 Dec 2008(Previously form 24-0078)						
Installer Responsibilities This certificate does not constitute authority to install. Installers working in accordance with the national regulations of a country other than the authority specified in Block 1, must ensure that their regulations recognize certifications from the country specified. Statements 13a or 14a do not constitute installation certification. In all cases, the aircraft technical record must contain an installation certification issued in accordance with the applicable national regulations before the aircraft may be flown.						



Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID **PO25216**

Purchase Order Date 7/30/2014

PO Print Date 7/30/2014

Page Number 1 of 2

Order From :
METCOR INC.
560 BOUL. ARTHUR SAUVE
SAINT-EUSTACHE, QC J7R 5A8
CA

VC-MET004

Ship To : DART AEROSPACE LTD
1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
CANADA

REVISED \$

Contact Name		Buyer	Chantal Lavoie
Vendor Phone	450 473 1884	Customer POID	
		Customer Tax #	10127-2607
Ship To Contact		Terms	Net 30
Ship To Phone		Currency	CAD
Ship Via:	Dart Truck	FOB	FCA - (Free Carrier)
Ship Acct:			

Line Nbr	Reference Vendor Part Number Line Comments Delivery Comments	Description/ Mfg ID	Req Date/ Taxable Promise Date	CD	Req Qty/ Unit of Measure	PO Unit Price	Extended Price
1	122839	D412-664-403 CROSSTUBE	7/31/2014 Yes 7/31/2014		1.00	\$1,015.00	\$1,015.00
STRESS RELIEF: 975° FOR 2 HOURS, ALLOW TO AIR COOL AT AMBIANT TEMPERETURE							
CROSSTUBE IS MADE FROM 17-4 PH MATERIAL							
Line Total:							\$1,015.00
2	71401-45	PROCUREMENT QUALITY CLAUSES	7/31/2014 No 7/31/2014		1.00	\$0.00	\$0.00
Procurement Quality Clauses A005 right of entry A012 chemical and physical test report A020 non-destructive test/inspection identification A021 dart aerospace processing A024 process certifications A026 certification of material conformance A043 retention of quality documents							

Note:

7/30/2014

METCOR INC.

560 BOUL. ARTHUR-SAUVÉ
ST-EUSTACHE, QC J7R 5A8
Tel: 450-473-1884 / Fax: 450-491-5498

Reçu de livraison

Delivery Receipt

BON DE TRAVAIL Order	EXPÉDITEUR Shipper ID	BON D'EXPÉDITION Shipper
197697	1	83374

EXPÉDITION COMPLÈTE / Shipped Complete

CLIENT /Customer 215

DART AEROSPACE
1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
Ph: 613-632-5200
Fax: 613-632-1053



LIVRÉ À /Shipped To

DART AEROSPACE
1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
Ph: 613-632-5200
Fax: 613-632-1053

COMMANDE DU CLIENT Customer PO	BON DE LIVRAISON DU CLIENT Customer Shipper No.	TYPE DE MATÉRIEL Material Type	DATE DE LA COMMANDE Order Date	TRANSPORTEUR Carrier
25216		STEEL	2014/7/30	client

QUANTITÉ Quantity	No. PIÈCE / Part No.	NOM DE LA PIÈCE / Part Name	DESCRIPTION DE LA PIÈCE Part Description	POIDS Weight
1	D412-664-403	CROSSTUBE		100,
	1	BOITE DE CARTON		

TYPE DE CONTENEUR Container Type	# DE CONTENEURS # Of Containers	COMMENTAIRES CONTENEUR Container Comments
BOITE DE CARTON	1	

EMPAQUETAGE Packing	
------------------------	--

QUANTITÉ EXPÉDIÉE / Quantity Shipped : 1
POIDS EXPÉDIÉ / Weight Shipped : 100,00
QUANTITÉ RESTANTE / Quantity Remaining : 0
POIDS RESTANT / Weight Remaining : 0,00

QUANTITÉ EXPÉDIÉE /Quantity Shipped: 1

POIDS EXPÉDIÉ / Weight Shipped : 100,00

Signature:

Date:

EXPÉDIÉ LE / Shipped On : 2014/07/31

METCOR INC.

560 BOUL. ARTHUR-SAUVÉ, ST-EUSTACHE, QC, J7R 5A8

Tél.: 450-473-1884

Télécopieur / Fax administration: 450-491-5498

Télécopieur / Fax production: 450 491-6454

Certificat de Conformité Détaillé

Detailed Certificate of Compliance

BON DE TRAVAIL order	CHARGEMENT load
197697	1

CLIENT / customer 215

DART AEROSPACE

1270 ABERDEEN

HAWKESBURY

ON K8A 1K7

LIVRÉ À / shipped to:

DART AEROSPACE

1270 ABERDEEN

HAWKESBURY

ON K8A 1K7

1

COMMANDE DU CLIENT customer po	BON DE LIVRAISON DU CLIENT customer shipper no.	MATÉRIEL material	MAÎTRE D'OEUVRE prime contractor	PROGRAM
25216		17-4PH		

SPÉCIFICATIONS DU PROCÉDÉ

processing specifications

STRESS REL

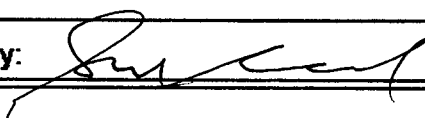
AT 925°F FOR 2 HOURS & ALLOWTC

EXIGENCE / requirement	SPÉCIFICATIONS / specified	TESTS EXÉCUTÉS / performed	RÉSULTATS DE TESTS / results
Visual			

QUANTITÉ quantity	POIDS weight	DESCRIPTION DES PIÈCES parts description
1	100	D412-864-403 CROSSTUBE 1 BOITE DE CARTON

COMMENTAIRES / comments

APPROUVÉ par / Approved by:



DATE: 2014-07-30

DATE: 2017-01-20

CONFIDENTIAL - CONTINUED

222 33

[illegible][illegible]

100-329500-10

525

DECLASSIFICATION AUTHORITY

3. PROCEED

[illegible]

1. *Chlorophyll a* (Chl *a*)
 2. *Chlorophyll b* (Chl *b*)
 3. *Chlorophyll c* (Chl *c*)
 4. *Chlorophyll d* (Chl *d*)
 5. *Chlorophyll e* (Chl *e*)
 6. *Chlorophyll f* (Chl *f*)
 7. *Chlorophyll g* (Chl *g*)
 8. *Chlorophyll h* (Chl *h*)
 9. *Chlorophyll i* (Chl *i*)
 10. *Chlorophyll j* (Chl *j*)
 11. *Chlorophyll k* (Chl *k*)
 12. *Chlorophyll l* (Chl *l*)
 13. *Chlorophyll m* (Chl *m*)
 14. *Chlorophyll n* (Chl *n*)
 15. *Chlorophyll o* (Chl *o*)
 16. *Chlorophyll p* (Chl *p*)
 17. *Chlorophyll q* (Chl *q*)
 18. *Chlorophyll r* (Chl *r*)
 19. *Chlorophyll s* (Chl *s*)
 20. *Chlorophyll t* (Chl *t*)
 21. *Chlorophyll u* (Chl *u*)
 22. *Chlorophyll v* (Chl *v*)
 23. *Chlorophyll w* (Chl *w*)
 24. *Chlorophyll x* (Chl *x*)
 25. *Chlorophyll y* (Chl *y*)
 26. *Chlorophyll z* (Chl *z*)
 27. *Chlorophyll aa* (Chl *aa*)
 28. *Chlorophyll ab* (Chl *ab*)
 29. *Chlorophyll ac* (Chl *ac*)
 30. *Chlorophyll ad* (Chl *ad*)
 31. *Chlorophyll ae* (Chl *ae*)
 32. *Chlorophyll af* (Chl *af*)
 33. *Chlorophyll ag* (Chl *ag*)
 34. *Chlorophyll ah* (Chl *ah*)
 35. *Chlorophyll ai* (Chl *ai*)
 36. *Chlorophyll aj* (Chl *aj*)
 37. *Chlorophyll ak* (Chl *ak*)
 38. *Chlorophyll al* (Chl *al*)
 39. *Chlorophyll am* (Chl *am*)
 40. *Chlorophyll an* (Chl *an*)
 41. *Chlorophyll ao* (Chl *ao*)
 42. *Chlorophyll ap* (Chl *ap*)
 43. *Chlorophyll aq* (Chl *aq*)
 44. *Chlorophyll ar* (Chl *ar*)
 45. *Chlorophyll as* (Chl *as*)
 46. *Chlorophyll at* (Chl *at*)
 47. *Chlorophyll au* (Chl *au*)
 48. *Chlorophyll av* (Chl *av*)
 49. *Chlorophyll aw* (Chl *aw*)
 50. *Chlorophyll ax* (Chl *ax*)
 51. *Chlorophyll ay* (Chl *ay*)
 52. *Chlorophyll az* (Chl *az*)
 53. *Chlorophyll aza* (Chl *aza*)
 54. *Chlorophyll abz* (Chl *abz*)
 55. *Chlorophyll acz* (Chl *acz*)
 56. *Chlorophyll adz* (Chl *adz*)
 57. *Chlorophyll aez* (Chl *aez*)
 58. *Chlorophyll afz* (Chl *afz*)
 59. *Chlorophyll agz* (Chl *agz*)
 60. *Chlorophyll ahz* (Chl *ahz*)
 61. *Chlorophyll aiz* (Chl *aiz*)
 62. *Chlorophyll ajz* (Chl *ajz*)
 63. *Chlorophyll akz* (Chl *akz*)
 64. *Chlorophyll alz* (Chl *alz*)
 65. *Chlorophyll amz* (Chl *amz*)
 66. *Chlorophyll anz* (Chl *anz*)
 67. *Chlorophyll aoz* (Chl *aoz*)
 68. *Chlorophyll apz* (Chl *apz*)
 69. *Chlorophyll aqz* (Chl *aqz*)
 70. *Chlorophyll arz* (Chl *arz*)
 71. *Chlorophyll asz* (Chl *asz*)
 72. *Chlorophyll atz* (Chl *atz*)
 73. *Chlorophyll auz* (Chl *auz*)
 74. *Chlorophyll avz* (Chl *avz*)
 75. *Chlorophyll awz* (Chl *awz*)
 76. *Chlorophyll axz* (Chl *axz*)
 77. *Chlorophyll ayz* (Chl *ayz*)
 78. *Chlorophyll azz* (Chl *azz*)
 79. *Chlorophyll azaa* (Chl *aza*
 80. *Chlorophyll abz* (Chl *abz*)
 81. *Chlorophyll acz* (Chl *acz*)
 82. *Chlorophyll adz* (Chl *adz*)
 83. *Chlorophyll aez* (Chl *aez*)
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 88. *Chlorophyll ajz* (Chl *ajz*)
 89. *Chlorophyll akz* (Chl *akz*)
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 91. *Chlorophyll amz* (Chl *amz*)
 92. *Chlorophyll anz* (Chl *anz*)
 93. *Chlorophyll aoz* (Chl *aoz*)
 94. *Chlorophyll apz* (Chl *apz*)
 95. *Chlorophyll aqz* (Chl *aqz*)
 96. *Chlorophyll arz* (Chl *arz*)
 97. *Chlorophyll asz* (Chl *asz*)
 98. *Chlorophyll atz* (Chl *atz*)
 99. *Chlorophyll auz* (Chl *auz*)
 100. *Chlorophyll avz* (Chl *avz*)
 101. *Chlorophyll awz* (Chl *awz*)
 102. *Chlorophyll axz* (Chl *axz*)
 103. *Chlorophyll ayz* (Chl *ayz*)
 104. *Chlorophyll azz* (Chl *azz*)
 105. *Chlorophyll azaa* (Chl *aza*
 106. *Chlorophyll abz* (Chl *abz*)
 107. *Chlorophyll acz* (Chl *acz*)
 108. *Chlorophyll adz* (Chl *adz*)
 109. *Chlorophyll aez* (Chl *aez*)
 110. *Chlorophyll afz* (Chl *afz*)
 111. *Chlorophyll agz* (Chl *agz*)
 112. *Chlorophyll ahz* (Chl *ahz*)
 113. *Chlorophyll aiz* (Chl *aiz*)
 114. *Chlorophyll ajz* (Chl *ajz*)
 115. *Chlorophyll akz* (Chl *akz*)
 116. *Chlorophyll alz* (Chl *alz*)
 117. *Chlorophyll amz* (Chl *amz*)
 118. *Chlorophyll anz* (Chl *anz*)
 119. *Chlorophyll aoz* (Chl *aoz*)
 120. *Chlorophyll apz* (Chl *apz*)
 121. *Chlorophyll aqz* (Chl *aqz*)
 122. *Chlorophyll arz* (Chl *arz*)
 123. *Chlorophyll asz* (Chl *asz*)
 124. *Chlorophyll atz* (Chl *atz*)
 125. *Chlorophyll auz* (Chl *auz*)
 126. *Chlorophyll avz* (Chl *avz*)
 127. *Chlorophyll awz* (Chl *awz*)
 128. *Chlorophyll axz* (Chl *axz*)
 129. *Chlorophyll ayz* (Chl *ayz*)
 130. *Chlorophyll azz* (Chl *azz*)
 131. *Chlorophyll azaa* (Chl *aza*
 132. *Chlorophyll abz* (Chl *abz*)
 133. *Chlor*

[illegible]

1. The first part of the report is a general introduction to the project, which includes a brief history of the project and a statement of the project's purpose.

DECLASSIFIED BY SP-6 BTJ/KJS

WALTON INC

001081	1
001081	0014
BON DE MONTANT	CARACTERISTIQUES
Données de base et de gestion	
CÉLÉBRE, 56 CÉLÉBRE, 56	

METCOR INC.

560 BOUL. ARTHUR-SAUVÉ, ST-EUSTACHE, QC, J7R 5A8

Tél.: 450-473-1884

Télécopieur / Fax administration: 450-491-5498

Télécopieur / Fax production: 450 491-6454

Certificat de Conformité Détaillé

Detailed Certificate of Compliance

BON DE TRAVAIL order	CHARGEMENT load
197697	1

CLIENT / customer 215

DART AEROSPACE

1270 ABERDEEN

HAWKESBURY

ON K6A 1K7

LIVRÉ À / shipped to:

DART AEROSPACE

1270 ABERDEEN

HAWKESBURY

ON K6A 1K7

1

COMMANDE DU CLIENT customer po	BON DE LIVRAISON DU CLIENT customer shipper no.	MATÉRIEL material	MAÎTRE D'OEUVRE prime contractor	PROGRAM
25216		17-4PH		
SPÉCIFICATIONS DU PROCÉDÉ processing specifications				
STRESS REL				
AT 925°F FOR 2 HOURS & ALLOWTO				
EXIGENCE / requirement SPÉCIFICATIONS / specified TESTS EXÉCUTÉS / performed RÉSULTATS DE TESTS / results				
Visual				
QUANTITÉ quantity	POIDS weight	DESCRIPTION DES PIÈCES parts description		
1	100	D412-664-403 CROSSTUBE 1 BOITE DE CARTON		

COMMENTAIRES / comments

STRESS RELIEF 524C, 2 HRS

Heat treatment (HT) was performed with equipment that meets the requirements of requested specification. All HT operations were performed in compliance with the required HT specification and all verifications have been performed and documented. No unauthorized changes were performed in regards to the HT. We certify that the material was manufactured, sampled, tested and inspected in accordance with the material specification and the purchase order and was found to meet the requirements.

Le traitement thermique (TT) a été fait en utilisant des équipements en conformité avec la spécification demandée. Toutes les opérations de TT ont été faites en conformité avec les requis de la spécification demandée et toutes les vérifications et les tests demandés ont été faites et documentés. Aucun changement n'a été faite par rapport au TT. On certifie que le matériel a été fabriqué, échantillonné, testé et inspecté en accord avec les spécifications du matériel et le bon de commande et le matériel rencontre les exigences spécifiées.

APPROUVÉ par / Approved by: Isabel Otero **Isabel Otero**
QA Technician **METCOR 12** DATE: 2014-07-31

1. Approving Civil Aviation Authority/Country Transport Canada		2. AUTHORIZED RELEASE CERTIFICATE Form Cne			3. Form Tracking Number: PS-2014-03-07-1	
4. Organizations Name and Address: Dart Aerospace Ltd., 1270 Aberdeen Street, Hawkesbury, Ontario, K6A 1K7, CANADA Tel: 1 (613) 632-5200 Fax: 1 (613) 632-5246 www.dartaero.com					5. Work Order/Contract/Invoice RD5388	
6. Item:	7. Description:	8. Part Number:	9. Quantity:	10. Serial/Batch Number:	11. Status/Work:	
1	Crosstube Assembly (412 HI AFT)	D412-664-403	1	B109981	Prototype	
12. Remarks: "NOT ELIGIBLE FOR INSTALLATION ON IS-SERVICE TYPE CERTIFIED AIRCRAFT" "THIS ITEM CONFORMS TO DATA THAT IS NOT APPROVED AT THE TIME OF RELEASE, SUBJECT TO APPROVAL OF THE DATA. THE ITEM IS IN CONDITION FOR SAFE OPERATION." **FOR USE IN AIRCRAFT WITH APPROVED FLIGHT TEST PLAN ONLY**						
13a. Certifies that the items identified above were manufactured in conformity to:			14a. ☐ CAR 571.10 Maintenance Release ☒ Other regulations specified in Block 13 Certifies that unless otherwise specified in Block 12, the work identified in Block 11 and described in Block 12, has been performed in compliance with the Canadian Aviation Regulations.			
☐ Approved design data and are in a condition for safe operation. ☒ Non-approved design data specified in Block 12.						
13b. Signature 		13c. Approval Organization Number 9-89	14b. Signature		14c. Approved Organization Number	
13d. Name Patrick Smith		13e. Date (dd/mm/yyyy): 07/Mar/2014	14d. Name		14e. Date (dd/mm/yyyy):	
30 Dec 2008(Previously form 24-0078)						
Installer Responsibilities This certificate does not constitute authority to install. Installers working in accordance with the national regulations of a country other than the authority specified in Block 1, must ensure that their regulations recognize certifications from the country specified. Statements 13a or 14a do not constitute installation certification. In all cases, the aircraft technical record must contain an installation certification issued in accordance with the applicable national regulations before the aircraft may be flown.						

4

RA 111748 D412-664-203

B109981

Received @ Dart may 12th, 2014
Inspected @ Dart June 17th, 2014

Customer:???
Customer contact:???
Shipped from:???

Instructions for RA 111748 D412-664-403 B109981 Rev PA2

- Cross tube was sent out for trial / flight testing
- Was sent out on prototype ARC
- Outside finish is damaged
 - Needs to be striped
 - Re-primed
 - Needs to be re-painted as per QSI 005
- Re-assemble as per released drawing
- Will need all new hardware for kit
- Needs new labels & paper works

Time Estimate = 5 HOURS

Departments Required: Finishing & Packaging

Pictures Attached = N/A

QTY INSPECTED = D412-664-403 B109981 Rev PA2

**THIS INSTRUCTION SHEET MUST
BE ATTACHED TO THE
RESTOCKING WORK ORDER AT
ALL TIMES!!!!**